

HP ProLiant ML150 Server NOS Installation and Software Guide



January 2004 (Third Edition)
Part Number 343330-003

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Before You Begin

Installation Highlights

This section is for **expert users** who are familiar with the standard installation process of their NOS. HP recommends taking into accounts the following **specific information in order to adapt your usual NOS installation** to the particularities of your HP ProLiant ML150 server.

Listed below are the HP drivers required for specific NOSs and the HP utilities. These drivers and utilities are provided on the *HP Startup CD-ROM*.

Microsoft® Windows® 2000 Server and Small Business Server 2000	HP drivers	Chipset driver
		Video driver
		LAN driver
		SCSI backplane driver
		SCSI driver
		ZCR driver
	HP utilities	HP Server Diagnostics for Windows®
		HP ML150 System Monitor (MSM)*

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Microsoft Windows Server 2003 (Enterprise Edition) and Small Business Server 2003	HP drivers	LAN driver
		ZCR driver
	HP utilities	HP Server Diagnostics for Windows
		HP ML150 System Monitor (MSM)*
Red Hat Linux 9.0 Professional	HP drivers	ZCR driver
	HP utilities	HP ML150 Server Health Driver (MSHD)*
United Linux 1.0 (SCO, SuSE, Turbo)	HP drivers	None
	HP utilities	HP ML150 Server Health Driver (MSHD)*
Turbolinux 8 Server	HP drivers	None
	HP utilities	HP ML150 Server Health Driver (MSHD)*
Red Flag Linux 4.0	HP drivers	None
	HP utilities	HP ML150 Server Health Driver (MSHD)*
SCO Open UNIX 8	HP drivers	SCSI driver
		LAN driver
	HP utilities	HP ML150 Server Health Driver for Unix (MSHD-U)*
SCO UnixWare 7	HP drivers	SCSI driver
		LAN driver
	HP utilities	HP ML150 Server Health Driver for Unix (MSHD-U)*

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SCO OpenServer 5.0.7	HP drivers	SCSI driver
		LAN driver
		ZCR driver
	HP utilities	HP ML150 Server Health Driver for OpenServer (MSHD-O)*

* Must be installed to support important server health functions.

NOTE: The *HP Startup CD-ROM* is not bootable.

The detailed instructions relative to each specific step (location of drivers, workarounds) are provided in the respective NOS chapters (Chapters 2 to 12). The installation information for the HP utilities is provided in Chapter 13. For the detailed information on using the HP utilities, please refer to Appendix A of this guide.

Preparing the Server for NOS Installation

NOTE: It is recommended that you do not install any third party adapter until you verify that the server is functioning properly and you complete the NOS installation.

- Prepare the server following the instructions in the *HP ProLiant ML150 Server Installation Sheet*.
- The HP ProLiant ML150 server comes with new hard disk drive(s) that do not need specific setup. If you install additional and USED hard disk drives in your new server:
 - Note that most NOS installations remove all data from the hard disk they are installed on. If you wish to use your additional hard disk drives to access existing data in your new server, HP recommends that you install and configure this (these) hard disk drive(s) AFTER completing the NOS installation.
 - If you wish to recycle used hard disk drives, use a utility such as FDISK to erase all data and partitions from your hard drive.

- HP recommends that you update your server BIOS with the latest system BIOS version to enjoy the most recent compatibility fixes. Insert the *HP Startup CD-ROM* in a Windows PC and follow the on-screen instructions. For more information, refer to the *HP ProLiant ML150 Server Operations and Maintenance Guide*.

Installing Microsoft Windows 2000 Server and Small Business Server 2000

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following materials:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- Microsoft Windows 2000 CD-ROM, as well as the latest Microsoft Windows 2000 Service Pack (#3 or above)

NOTE: For ease of reading, we will refer to both Windows 2000 Server and Small Business Server 2000 as Windows 2000 in this chapter.

- One blank, formatted 3.5-inch diskette
- Two or more clients for testing purposes (optional)

NOTE: If an optional ZCR card is installed in the server, you need one blank, formatted 3.5-inch diskette to create and install the ZCR driver. Please refer to the “Section 7. Installing the ZCR Driver” section later in this chapter.

High Level Process Flow

1. Creating the driver diskette using the *HP Startup CD-ROM*
2. Performing Windows 2000 Server installation
3. Completing the installation (Microsoft Service Pack, HP drivers, Recovery Console)
4. Configuring the system
5. Configuring the network
6. Installing MSM
7. Installing the ZCR driver
8. Troubleshooting
9. On-line information and software sources

Section 1. Creating the Driver Diskette

1. Insert one blank, formatted 3.5" diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and follow the on-screen instructions to create the Windows 2000 SCSI driver diskette (HP disk W2K SCSI).

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the *Startup CD-ROM*.

Section 2. Performing the Windows 2000 Installation

NOTE: Though you may install Windows 2000 from setup diskettes or directly from the Windows 2000 CD-ROM, we recommend you use the second method because it is faster.

1. Boot the new server from the Windows 2000 CD-ROM.
2. You will see a message that reads, **Setup is inspecting your hardware configuration** . Then the setup screen will be displayed.

3. Always press F6 when the system briefly shows the message of **Press F6 if you need to install a third party SCSI or RAID controller** at the bottom of the display.

NOTE: Unfortunately, Windows 2000 setup only gives you a short time to press the **F6** key. If you miss it, reboot the system and start from step 1 above.

- a. Press the **S** key to specify additional SCSI adapters.
 - b. When prompted, insert the HP disk W2K SCSI you created from the *HP Startup CD-ROM*.
 - c. Press the **Enter** key to continue.
 - d. Select **Adaptec Ultra 320-SCSI Cards (Win2000)**, and then press the **Enter** key.
4. Press the **Enter** key to proceed to the **Windows 2000 Server Setup - Welcome to Setup** screen.
5. Press the **C** key to continue Setup on the **Setup has determined that your computer's startup hard disk is new...** screen.
6. Press the **F8** key to accept the licensing agreement.
7. On the drives partitioning screen, select the target drive. If you want to use the entire drive to install Windows 2000, then press the **Enter** key. Otherwise, press the **C** key to create a partition.

In this example, we will create a 4 GB partition. Please note that Windows 2000 does not have the 2 GB limitation present on Windows NT® 4.0.

- a. Press the **C** key to create a partition.
 - b. At the **Create partition size** prompt, type 4096 and press the **Enter** key.
 - c. HP recommends that you create all the partitions needed for each hard drive present on the system. Select unpartitioned space and press the **C** key again to create additional partitions.
8. Select the target drive to be used to install Windows 2000. Press the **Enter** key.
9. Select **Format the partition using the NTFS file system** and press the **Enter** key.
10. The installer will format and copy files to the hard drive.

11. The system will reboot and launch Windows 2000 graphic interface. Be sure to remove the driver diskette before the reboot.
12. At the **Installation Wizard** first dialog box, click **Next** to continue.
13. The **Installing Devices** screen will be shown with a progress bar on the display. This may take 10 to 15 minutes.
14. You can now proceed through the customization of your installation using the graphical interface.

NOTE: The network settings may need to be customized to your environment. Refer to Microsoft 2000 manuals should you need further details on network settings.

15. The **Installing Components Display** screen starts with a progress bar. It may take up to 20 minutes to complete this section.
16. The wizard will then automatically start the **Performing Final Tasks** section to complete the installation. This step in the installation may take some time as well.

NOTE: There may be a period of time with no apparent activity at the "Saves Settings." Please be patient.

17. On the **Completing the Windows 2000 Setup Wizard** screen, remove the CD-ROM then click **Finish**. The system will automatically reboot from the hard drive.
18. Follow the on-screen instructions to logon (pressing the **Ctrl-Alt-Del** keys) as the Administrator.
19. If you installed Windows 2000 Server, **Windows 2000 Configure Your Server** will launch. Close this window, as we will postpone the customization of the server until completion of all the installation steps.

If you installed Microsoft Small Business Server 2000, click **Cancel** to close the **Setup needs the location of the Small Business server 2000 Setup files...** window.

NOTE: You may open the Windows 2000 Configure Your Server wizard at any point in time by clicking **Start > Programs > Administrative Tools > Configure Your Server**.

Section 3. Completing the Installation

Phase 1 –Installing the Service Pack

1. How to get a copy of Windows 2000 Service Packs:
 - If the HP server is already connected to the internet, you can download the latest Service Pack from Microsoft website at:
<http://www.microsoft.com/windows2000/downloads/servicepacks/default.asp>
 - If you have access to a PC connected to the internet and equipped with a CD-RW drive, you may download the latest Service Pack from Microsoft at:
<http://www.microsoft.com/windows2000/downloads/servicepacks/default.asp>
then copy the Service Pack on a CD-ROM. It allows you to install the Service Pack from the CD-ROM drive of the HP server.
 - You may contact Microsoft Support at (800) 360 7561 or fax to (716) 447 7330 to order a Service Pack CD-ROM shipped to you.
2. To install the Service Pack, logon on the HP ProLiant ML150 server as the Administrator, then run the Service Pack on the system.
3. If prompted, press **OK** to accept Microsoft 2000 Publisher Certificate.
4. Select **Accept the License Agreement** then click **Install**.
5. When prompted, click **Restart** to reboot the system (remember to remove all diskettes and CD-ROM from their respective drives).

Phase 2 –Installing the HP Onboard Drivers

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the server, and the **Startup** menu will display.

NOTE: If the server does not auto-start the Startup menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

2. Click **hp ProLiant ML150 server drivers for Chipset, LAN controller, Video, SCSI controller and SCSI backplane**, and the ML150 driver matrix will display. Follow the on-screen instructions to install the chipset and video drivers.

3. Click **Start > Settings > Control Panel > System > Hardware > Device Manager**.
4. Update the LAN driver for the **Intel®PRO/1000 M T Port Network Connection** by browsing for HP Startup CD-ROM\drivers\w2k_LAN.
5. Update the SCSI Backplane driver for the **SDR GEM318P SCSI Processor Device** by browsing for HP Startup CD-ROM\drivers\w2k_gem318.
6. Exit all open windows and restart the server in order to initialize the server properly.

Phase 3 –Installing Windows 2000 Recovery Console

Please refer to Tip#4 in the Troubleshooting section.

Section 4. Configuring the System

Phase 1 –Performing Hardware Status Check

In this section you will run Windows 2000 Device Manager tool to identify any issues with the installed devices or resource conflicts.

1. Click **Start > Settings > Control Panel > System > Hardware > Device Manager**.
2. Verify that no devices have either a yellow band (!) or question mark (?) symbol next to it.
 - Yellow (!) means that there is a resource issue with the device.
 - Question (?) means that the device is unknown.

If (!) or (?) symbols are reported then double click on each of the devices with (!) or (?). Use the Device Status message for troubleshooting. Or, if a printer is available, use the **View, Print** from the menu to get a report.

3. Verify if the installed drivers are digitally signed.
 - a. In the Device Manager, select the device (e.g. Adaptec AIC-7902 based Ultra 320 SCSI) that you want to verify.
 - b. Right click **Properties > Driver**.
 - c. Locate the **Digital Signer**:. If the driver of that device is digitally signed then it will display **MS Windows 2000 Publisher** or **Microsoft Windows Hardware Compatibility Publisher**. If the driver of the device is not digitally signed, we recommend that you check the HP Website www.hp.com to install the latest driver package.
4. Exit the **Device Manager**, **System Properties** and **Control Panel** applications.
5. Check the event viewer to be sure that there are no errors in the log. Click **Start > Programs > Administrative tools > Event viewer**.

NOTE: Windows 2000 Event Viewer may have recorded network errors because your network is not configured yet. Please disregard these errors.

6. Exit Event Viewer.

Phase 2 –Initializing Hard Disk Drive

To manage your different drives and partitions:

1. Click **Start > Programs > Administrative Tools > Disk Administrator**.
2. Click **OK** to proceed when notified you have a new hard disk to configure.
3. Select available hard disk space on the graphic and use menus to create additional partitions.
4. Exit the Disk Administrator.
5. To complete the formatting of new partitions, open **My Computer**, then right click the new unformatted partition(s) and select format.

To start the disk administrator use the following procedure.

1. Click **Start > Programs > Administrative Tools > Computer Management**.
2. Double click **Storage > Disk Management** in the tree.
3. The **Write Signature and Upgrade** wizard will start if you have new hard drives with no signatures on them. Follow the on-screen instructions to create this signature.
4. Select available hard disk space on the graphic and use menus to create additional partitions.
5. Format all partitions that are not already formatted.
6. Exit the Computer Management tool.

NOTE: There are two types of hard-drive configuration: Dynamic and Basic. You can select the appropriate type by right clicking on the disk drive icon. Dynamic drives are used to create volumes, which can contain more than one physical hard drive. Basic drives are used to create primary or local partitioned drives.

Phase 3 –Adding Terminal Server Services

1. Open **Start > Settings > Control Panel > Add/Remove Programs**.
2. Click **Add/Remove Windows Components**.
3. Scroll to and click **Terminal Services** checkbox, and then click **Next**.
4. Select the mode you want to use: **Remote administration mode or Application sever mode**, and then click **Next**.

NOTE: The following instructions are based on the Application Server mode. Please note the licensing requirement listed on the screen for this mode. Consult with your Microsoft representative for setting the licensing server.

5. Select the default permissions for application compatibility then click **Next**.
6. Click **Next** to accept support tools and administrator tools settings.
7. If prompted, insert the Windows 2000 CD-ROM.
8. Click **Finish** to close the Wizard.

9. Click **Yes** to restart the system. (Remove the CD-ROM).
10. After the system reboots, login to the system.
11. Open **Start > Settings > Control Panel > Administrative Tools**. Check that the following services are now available: **Terminal Services Client Creator**, **Terminal Services Configuration** and **Terminal Services Manager**.

Creating Client Installation Diskettes

1. Double click **Terminal Services Client Creator**.
2. Select the appropriate client type for your environment.
3. Click **Format disk** if needed. Check the number of disks required and label them as "Terminal Services for [...] Disk [x/y]." Click **OK** to proceed.
4. Follow the on-screen instructions to perform the diskettes copies.
5. Click **OK** on the screen that reads, **[y] floppies were created**
6. Click **Cancel** to end the Create Installation disks utility.

Installing the Client Utility on a Client Workstation

1. Insert diskette 1 in the target client and run
A:\setup.exe
2. Click **Continue** on the setup screen.
3. Complete the Name and Organization Information form. You will be prompted for this information only the first time the diskettes are used. Click **OK** to validate and then **OK** again to confirm.
4. Click **I Agree** to accept the license agreement.
5. Click the **Large Icon** to start installation.
6. Select the installation mode you feel appropriate: all users (**Yes**) or current user only (**No**).
7. Insert following diskette(s) when prompted and follow the on-screen instructions.
8. Click **OK** when the installation is completed then shutdown and restart workstation.

Section 5. Configuring the Network

Phase 1 –Configuri ng Server IP Address

During the installation process the system was configured to use DHCP (Dynamic Host Configuration Protocol). If no DHCP server is found on the network, the system will auto-configure a random IP address to start functioning. It is important that you configure the proper IP address to be able to communicate with the clients:

1. Right click **My Network Places > Properties > Local Area Connection** on the HP server.

NOTE: If the HP server hosts several network adapters, the window will show one Local Area Connection icon for each Network adapter present in the system. Identify the proper adapter by browsing each one.

2. Click **Internet Protocol (TCP/IP) > Properties > Use the following IP address**.
3. Enter appropriate IP address.
4. Click **OK** to continue, and then **OK** again to exit the **Local Area Connection Properties** window. Click **Yes** to restart the server and take these settings into account.

Phase 2 –Attaching Clients to Network and Test Network Link

1. Create shares: create a folder on the HP server hard drive then share it (right click **Sharing**).
2. Create users using Windows 2000 Computer Management utility: **Start > Programs > Administrative Tools > Computer Management > System tools > Local Users and Groups Users**.
3. Connect clients PC to the network that the HP server operates on.
4. Open a command prompt window to verify the TCP/IP configuration and enter the command:

`ipconfig / all`
5. To verify the server and clients can communicate properly:

From one of the clients, open a command prompt and type:

```
ping computername
```

where *computername* is the server name you entered during Windows 2000 installation. You should get four replies from the new server. If there is a link problem, it must be fixed before going any further.

You may test the link further by doing a ping between two clients: at the same command prompt, type:

```
ping other_client_ipaddress
```

You should get four replies from the second client.

6. Copy files back and forth from the clients to the server.

Testing the Connection Using Terminal Services

1. Click **Start > Programs > Terminal Services Client > Terminal Services Client** on a client you installed Terminal Services on.
2. Select the target server from the Available Servers list provided on the screen.
3. Click the **Connect** button.
4. Complete the User ID, Password login form.

Phase 3 –Domain Controller Setup

The Windows 2000 reference guide calls this process “Promoting the server to a domain controller.”

1. Click **Start > Programs > Administrative Tools > Configure Your Server** to open the **Windows 2000 Configure Your Server** window.
2. Select **Active Directory**.
3. Scroll down and click **Start the Active Directory** wizard.
4. Click **Next** to continue.

NOTE: The following instructions correspond to the standard steps for new domain creation. You may customize the options proposed by Windows 2000 to match your environment.

5. Click **Next** at the **Domain Controller Type** to accept the default: **Domain Controller for a new Domain**.
6. Click **Next** at the **Create Tree or Child Domain** to accept the default: **Create a new domain tree**.
7. Click **Next** at the **Create or Join Forest** to accept the default **Create a new forest of domain trees**.
8. At the text box for **Full DNS name for new domain**: type in the assigned DNS name for the server (for example: mycompany.com).
9. Click **Next**. The system may take a few minutes before moving to the next screen.
10. Click **Next** at the **NetBIOS Domain Name** dialog box to accept the default: **Domain NetBIOS name**.
11. Click **Next** to accept the **Database and Log Locations** default directories.
12. Click **Next** to accept the default **Shared System Volume**.
13. The system will display a dialog box that reads, **The Wizard can not contact the DNS Server....** Confirm your DNS configuration, or install and configure a DNS server on this computer. Click **OK**.
14. Click **Next** to accept the installation of DNS on the new server.
15. Click **Next** to accept the default permission value: **Permissions compatible with pre-Windows2000 Server**.
16. Enter and confirm the Administrator password and click **Next**.
17. Review the **Summary** display and click **Next** to continue.
18. The system will start configuring the active directory display. It will take a few minutes to complete.
19. If prompted, insert Windows 2000 CD-ROM and click **OK** to continue.
20. Configuring active directory display shows again. Click **Finish** to close the Wizard utility. This completes the active directory installation.
21. Click **Restart Now** to reboot the system. Remove the CD-ROM if present.
22. At the login prompt, type in the password. Click the **Options** button and verify that **Log on to: HOST** displays on the dialog box. Click **OK** to start the logon process.

Section 6. Installing MSM

Please refer to “Installing MSM” in Chapter 13 for the detailed instructions on installing MSM from the Startup CD-ROM.

Section 7. Installing the ZCR Driver

If an optional ZCR card is installed in your server, an appropriate driver is required for the ZCR controller to operate properly. You can create the driver diskette from the *HP Startup CD-ROM* for easy installation.

Creating the Driver Diskette

1. Insert one blank, formatted 3.5” diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.
3. Select the proper driver to install.
4. Follow the on-screen instructions to create the driver diskette.

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Performing the Installation

1. Boot the server from the Windows 2000 CD-ROM.
2. You will see a message that reads, **Setup is inspecting your hardware configuration**. Then the setup screen will be displayed.
3. Always press the **F6** key when the system briefly shows the message of **Press F6 if you need to install a third party SCSI or RAID controller** at the bottom of the display.

NOTE: Unfortunately, Windows 2000 setup only gives you a short time to press the **F6** key. If you miss it, reboot the system and start from step 1 above.

- a. Press the **S** key to specify additional SCSI adapters.
 - b. When prompted, insert the ZCR driver diskette you created from the Startup CD-ROM.
 - c. Press the **Enter** key to continue.
 - d. Select **Adaptec I20 RAID Adapters for Windows 2000 & XP 32 bit**, and then press the **Enter** key.
 - e. Press the **Enter** key to continue.
4. Press the **Enter** key to proceed to the **Welcome to Setup** screen. Continue with the standard Windows installation as described in Step 5 of the “Section 2. Performing the Windows 2000 Installation” section earlier in this chapter.

Section 8. Troubleshooting

This section will help you resolve some of the most common installation problems associated with Windows 2000.

Tip #1. Windows 2000 Installation Halts about Three Minutes after Starting to Boot from CD-ROM

When installing Windows 2000 on any X86 system with more than one hard drive it is possible to experience the following error:

```
Setup has encountered an error and cannot continue. Contact
technical support for assistance. The following status codes
will assist them in diagnosing the problem. (0x4, 0x1, 0x0,
0x0)
```

The cause of this problem is that the NTLOADER is encountering a duplicate hard drive signature. This signature is calculated by the NTLOADER code after reading a specific sector offset from the hard drive. The following list provides some of the things that can cause a hard drive to have duplicate signatures:

1. Low-level formatting the drives. We reproduced this on several systems at HP.
2. When you have a set of drives previously used with a DAC and move them to a SCSI adapter.

3. Using a disk imaging utility to duplicate a hard drive will create a duplicate signature.

At this time, Microsoft has no fix for this problem. For more information please refer to Microsoft document ID: Q226361.

HP recommends that you use the following workaround for this problem.

1. If you experience this problem, remove all drives with the exception of the target boot drive. Install Windows 2000 and then add the removed hard drives to the system after installation of the OS.
2. Run the Disk Management tool to prepare the remainder of the drives to be used in the system.
 - a. Boot the system with a Windows 98SE recovery diskette. (This version supports FAT32, which works on larger hard drives.)
 - b. Perform an FDISK on each drive.
 - c. Install Windows 2000.

Tip #2. Configuring the Parallel (LPT) Port for ECP Mode

The device manager may not show this port on the list when not configured in ECP mode.

HP recommends that you systematically configure the LPT port for ECP mode. Use the following procedure to change the setting:

1. Press the **Delete** key during power on self-test.
2. Select **Advanced > Super IO Configuration > Parallel Port Address** to 378.
3. Press the **Enter** key and select **ECP** from **Parallel Port Mode**.
4. Press the **Enter** key and the **F10** key to save and exit.

Tip #3. Windows 2000 Drivers Signatures

Windows 2000 checks for digital signatures on driver files to help maintain system integrity. During the installation or update of a driver, if there is no matching signature file Windows 2000 displays a “Digital Signature not Found” box.

- To expedite release of new products, HP may ship drivers without signature files. All Windows 2000 drivers provided by Hewlett-Packard are submitted to Microsoft for certification testing. Upon completion of testing, Microsoft produces signature files. HP then posts the revised driver package at <http://www.hp.com>.
- If a signature warning is displayed during installation of a driver, you may override the warning. We recommend that you check the HP Website for the latest driver package. If available, install the new driver.
- You can elect to have Windows 2000 ignore signatures: Open **Start > Settings > Control Panel > System > Hardware > Driver Signing**. This is helpful if you are setting up multiple systems.
- Digital signatures are a powerful way to ensure system integrity as you add drivers to the systems - whether provided by HP or others.

Tip #4. Windows 2000 Recovery Options

In the event that the current installation of Windows 2000 fails to boot (this might happen after installing a new driver, component, software, etc), Windows 2000 provides the following recovery options to help you gain access to your Windows 2000 installation to replace damaged files and services for troubleshooting purpose. HP therefore recommends that you install the Recovery Console (refer to option 3 below) to enhance the system configuration.

Recovery option #1: Last Known Good Configuration

- Activated by pressing the **F8** key during the system process of Windows 2000 and selecting **Last Known Good Configuration** from the menu.
- This boot mode is used in the case that the system fails to boot after installing a new software or driver. The system will use the previous registry setting to initialize and boot the system.

Recovery option #2: Safe Mode Boot

This is activated by pressing the **F8** key during the OS boot. It provides a minimal configuration with required drivers and services. The safe mode boot provides three options:

- **Standard safe mode boot** – provides no network services or drivers.
- **Networking disabled** – excludes network services and drivers.
- **Directory services restore mode** – brings system up with directory services disabled with the intent of recovering active directory. Safe mode boot is guided by the registry key `hklm\CurrentControlSet\Control\SafeBoot` with the use of the Minimal and Network subkeys. The IO Manager and Service Control Manager look at the registry to load the driver and services. Such approach avoids loading a problematic driver or service.
- **Command prompt** – provides an alternate command shell `CMD.EXE` instead of the explorer. This is dictated by the registry key:
`hklm\system\CurrentControlSet\Control\SafeBoot\AlternateShell`

There is a Safe-Mode boot loophole. Since `NTLDR` loads “Boot Load” drivers, these drivers bypass the IO Manager's Safe Mode check.

Recovery option #3: Recovery Console (RC) Boot

The Recovery Console (RC) can be used when safe boot fails. You can enter RC using one of the following:

- Booting from Windows 2000 CD-ROM
- Installing the RC boot on the system

It is recommended to install the RC immediately after installing Windows 2000.

Start RC Booting from Windows 2000 CD-ROM

If you have a need of booting the Windows 2000 recovery console but this feature is not installed on the system, use the following procedure to boot the RC from the Windows 2000 CD-ROM.

1. Insert the Windows 2000 CD-ROM and start the reboot sequence.
2. Press any key when prompted to start booting from the Windows 2000 CD-ROM.
3. Press the **F10** key on the **Welcome to Setup** screen.

NOTE: This is an undocumented option. The bottom of the display is asking you to press the **Enter**, **R**, or **F3** key.

4. The system will display a menu asking to select the instance of the NOS you want to boot. For example:
1: C:\WINNT
5. Type 1 and then press the **Enter** key.
6. Type the Administrator password when prompted.
7. At the command prompt, type `help` and proceed to achieve your objective.
8. Type `exit` when done troubleshooting.

Installing RC

1. Insert Windows 2000 CD-ROM. If CD-ROM auto-start is enabled, click `exit` to close the applet.
2. Open a command prompt, and type `D:\I386\WINNT32 /CMDCONS` (Where *D:* is the CD-ROM drive letter).
3. Follow the on-screen instructions to complete the RC installation.

Booting RC

1. Shutdown and restart the system.
2. Select **Windows 2000, Recovery Console** from the boot menu.
3. The system will display a menu asking to select the instance of the NOS you want to boot. For example it displays:
1: C:\WINNT
4. Type 1 and then press the **Enter** key.
5. Type the Administrator password when prompted.

6. At the command prompt, type `help` and proceed to achieve your objective.
7. Type `exit` when done troubleshooting.

NOTE: The file access security can prevent you from getting to certain files.

Tip #5. Restarting Windows 2000 Installation

If you want to restart the Windows 2000 installation from the very beginning, use a utility such as FDISK to erase all data and partitions from your hard drive. You can then resume the installation process.

Section 9. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com>
- Microsoft World Wide Web access: <http://www.microsoft.com>
- Microsoft Product Support Services: <http://support.microsoft.com/directory>

Installing Microsoft Windows Server 2003 and Small Business Server 2003

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation, and then gather the following materials:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- Microsoft Windows 2003 CD-ROM(s), as well as the latest Microsoft Windows 2003 Service Pack (if there exists one)

NOTE: For ease of reading, we will refer to both Windows Server 2003 and Small Business Server 2003 as Windows 2003 in this chapter.

- Two or more clients for testing purpose (optional)

NOTE: If an optional ZCR card is installed in the server, you need one blank, formatted 3.5-inch diskette to create and install the ZCR driver. Please refer to the “Section 6. Installing the ZCR Driver” section later in this chapter.

High Level Process Flow

1. Performing the Windows 2003 installation
2. Completing the installation (Service Pack—if there exists one, Recovery Console)
3. Configuring the system
4. Configuring the network

5. Installing MSM
6. Installing the ZCR driver
7. Troubleshooting
8. On-line information and software sources

Section 1. Performing the Windows 2003 Installation

1. Boot your new server from the Windows 2003 CD-ROM.
2. For Windows Small Business Server 2003, press the **Enter** key to continue on the **Setup Notification** screen.
3. Press the **Enter** key to continue on the **Welcome to Setup** screen.
4. Press the **F8** key to accept the licensing agreement.
5. On the drives partitioning screen, select the target drive. If you want to use the entire drive to install Windows 2003, then press the **Enter** key. Otherwise, press the **C** key to create a partition. In this example, we will create a 4 GB partition.
 - a. Press the **C** key to create a partition.
 - b. At the **Create partition size** prompt, type 4096 and press the **Enter** key.
 - c. HP recommends that you create all the partitions needed for each hard drive present on your system. Select unpartitioned space and press **C** again to create additional partitions.
 - d. Select the target drive to be used to install Windows 2003. Press the **Enter** key.
6. Select **Format the partition using the NTFS file system** and press the **Enter** key.
7. Press the **F** key (for Windows Server 2003 only), and the installer will format and copy files to the hard drive.
8. The system will reboot and launch the Windows 2003 graphical interface. Be sure to remove any driver diskette before the system reboots.
9. You can now proceed through the customization of your installation using the graphical interface.

NOTE: The network settings may need to be customized to your environment. Please refer to Microsoft 2003 manuals should you need further details on the network settings.

10. The **Installing Windows** screen starts with a progress bar. It may take up to 20 minutes to complete this section.
11. The wizard will then automatically start the **Finalizing installation** section to complete the installation. This step in the installation may take some time as well.

NOTE: There may be a period of time with no apparent activity at the **Saving Settings** prompt. Please be patient.

12. After the installation is complete, the system will automatically reboot from the hard drive.
13. Follow the on-screen instructions to log on (pressing the **Ctrl-Alt-Del** keys) as Administrator.
14. **For Windows Server 2003:**

The initial logon will automatically launch the **Manage Your Server** screen. Close this window, as we will postpone the customization of the server until completion of all the installation steps.

NOTE: You may open the **Manage Your Server** wizard at any point in time by clicking **Start > All Programs > Administrative Tools > Manage Your Server**.

For Windows Small Business Server 2003:

The initial logon will automatically launch the **Microsoft Windows Small Business Server Setup** window. Close this window, as we will postpone the customization of the server until completion of all the installation steps.

NOTE: You may open the Microsoft Windows Small Business Server Setup wizard at any point in time by double-clicking the **Continue Setup** icon on the desktop of the server.

Section 2. Completing the Installation

Installing the Service Pack

Microsoft has not released any Service Pack at the time of the publication of this guide. Please check from Microsoft at <http://www.microsoft.com/> for the information on the Service Pack.

Installing the LAN Driver

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the server.
2. When the **Startup** menu appears, exit the menu.
3. Click **Start > Control Panel > System > Hardware > Device Manager**.
4. Click **Network adapters**.
5. Right-click **Intel(R) PRO/1000 MT Server Adapter**, and select **Update Driver**.
6. Select **Install from a list or specific location**, and click **Next**.
7. Browse for **HP Startup CD-ROM\drivers\ws2003_LAN**, and click **Next** to update the LAN driver.
8. After the installation is finished, click **Finish**.
9. Exit all open windows and restart the server in order to initialize the server properly.

Installing Windows 2003 Recovery Console

Refer to Tip#2 in the “Troubleshooting” section.

Section 3. Configuring the System

Phase 1 –Performi ng Hardware Status Check

In this section, you will run the Windows Device Manager tool to identify any issues with the installed devices or resource conflicts.

1. Open **Start > Control Panel > System > Hardware > Device Manager**. Verify that no devices have either a yellow band (!) or question mark (?) symbol next to it.

— Yellow (!) means that there is a resource issue with the device.

— Question (?) means that the device is unknown.

If (!) or (?) symbols are reported then double click on each of the devices with (!) or (?). Use the Device Status message for troubleshooting. Or, if a printer is available, use the **Action > Print** from the menu to get a report.

2. Verify if the installed drivers are digitally signed.
 - a. In the Device Manager window, click SCSI and RAID controllers and select the device (e.g. Adaptec AIC-7902-based Ultra320 SCSI) that you want to verify.
 - b. Right-click to select **Properties > Driver**.
 - c. Locate **Digital Signer:**. If the driver of that device is digitally signed, it will be indicated by the signer. If the driver of the device is not digitally signed, we recommend that you check the HP Website www.hp.com to install the latest driver package for that device.
3. Exit the Device Manager, System Properties and Control Panel applications.
4. Check the event viewer to make sure that there are no errors in the log. Click **Start > All Programs > Administrative Tools > Event Viewer**.

NOTE: Windows 2003 Event Viewer may have recorded network errors because your network is not configured yet. Disregard these errors.

5. Exit Event Viewer.

Phase 2 –Initializing Hard Disk Drive

NOTE: There are two types of hard drive configurations: Dynamic and Basic. You can select the appropriate type by right clicking on the disk drive icon. Dynamic drives are used to create volumes, which can contain more than one physical hard drive. Basic drives are used to create primary or local partitioned drives.

To manage your different drives and partitions:

1. Click **Start > All Programs > Administrative Tools > Computer Management > Disk Management**.
2. The Write Signature and Upgrade wizard will start if you have new hard drives with no signatures on them. Follow the on-screen instructions to create this signature.
3. Click **OK** to proceed when notified you have a new hard disk to configure.
4. Right-click to select available hard disk space and use the **New Partition** wizard to create and format the additional partitions, if desired.
5. Exit the Computer Management tool.

Section 4. Configuring the Network

Phase 1 –Configuri ng Server IP Address

During the installation process, the system was configured to use DHCP (Dynamic Host Configuration Protocol). If no DHCP server is found on the network, the system will auto-configure a random IP address to start functioning. It is important that you configure the proper IP address to be able to communicate with the clients:

1. Click **Start > Control Panel > Network Connections > Local Area Connection** on the HP server.

NOTE: If the HP server hosts several network adapters, the window will show one Local Area Connection icon for each network adapter present in the system. Identify the proper adapter by browsing each one.

2. Click **Internet Protocol (TCP/IP) > Properties > Use the following IP address**.

3. Enter an appropriate IP address and its subnet mask (if necessary).
4. Click **OK** then **Close** to exit the **Local Area Connection Properties** window.

Phase 2 –Attaching Clients to Network and Test Network Link

1. Create shares: create a folder on the HP server hard drive then share it (by right-clicking the folder and selecting **Sharing and Security**).
2. Create users using the Windows 2003 Computer Management utility: **Start > All Programs > Administrative Tools > Computer Management > System Tools > Local Users and Groups**.

For Windows Server 2003: Action > New User.

For Windows Small Business Server 2003: Users > Action > New User.

3. Connect clients PC to the network that the HP server operates on.
4. Open a command prompt window to verify the TCP/IP configuration and enter the command:

```
ipconfig /all
```

5. To verify the server and clients can communicate properly:

- a. From one of the clients, open a command prompt and type:

```
ping computername
```

where *computername* is the server name you entered during the Windows installation. You should get four replies from the new server. If there is a link problem, it must be fixed before going any further.

You may test the link further by doing a ping between two clients. At the same command prompt, type:

```
ping other_client_IPaddress
```

Where *other_client_IPaddress* is the IP address of another client PC on this network.

You should get four replies from the second client.

- b. Copy files back and forth from the clients to the server.

Phase 3 –Domain Controller Setup

In order to promote the server to a domain controller, proceed with the following:

For Windows Server 2003:

1. Click **Start > All Programs > Administrative Tools > Manage Your Server** to open the **Manage Your Server** window.
2. Select **Add or remove a role**.
3. Windows will advise you of preliminary steps to take before proceeding with Server configuration.
4. Click **Next** to continue.
5. Select **Custom configuration** and click **Next**.
6. From the **Server Role** menu, select **Domain Controller (Active Directory)**. Click **Next** to continue.
7. On the **Summary of Selections** screen, click **Next** to continue onto the **Active Directory Installation** wizard. Click **Next** to begin.
8. Click **Next** at the **Operating System Compatibility** screen.

NOTE: The following instructions correspond to the standard steps for new domain creation. You may customize the options proposed by Windows 2003 to match your networked environment.

9. Click **Next** on the **Domain Controller Type** screen to accept the default: **Domain controller for new domain**.
10. Click **Next** on the **Create New Domain** screen to accept the default: **Domain in a new forest**.
11. If the current network does not contain a DNS server, choose **No, just install and configure DNS on this computer**, and then click **Next** to continue.
12. At the text box for **Full DNS name for new domain:**, type the assigned DNS name for the server (for example: mycompany.com).
13. Click **Next**. The system may take a few minutes before moving to the next screen.

14. Click **Next** at the **NetBIOS Domain Name** dialog box to accept the default: **Domain NetBIOS name:**.
15. Click **Next** to accept the **Database and Log Folders** default directories.
16. Click **Next** to accept the default **Shared System Volume**.
17. Click **Next** to accept the default permissions: **Permissions compatible only with Windows 2000 or Windows Server 2003 operating systems**.
18. Enter and confirm the Administrator password and click **Next**.
19. Review the **Summary** display and click **Next** to continue.
20. The system will start configuring the active directory and DNS services, if chosen. It will take a few minutes to complete.
21. If prompted, insert the Windows 2003 CD-ROM and click **OK** to continue.
22. Configuring active directory display shows again. Click **Finish** to close the Wizard utility. This completes the active directory installation.
23. Click **Restart Now** to reboot the system. Remove the CD-ROM if present.
24. At the login prompt, type the password. Click the **Options** button and verify that **Log on to: HOST** appears on the dialog box. Click **OK** to start the logon process.
25. **This Server is Now a Domain Controller** dialog box will display after the login, click **Finish** to close.

For Windows Small Business Server 2003:

1. Connect the server to a network.
2. Double-click the **Continue Setup** icon on the desktop of the server to open the Microsoft Windows Small Business Server Setup wizard.
3. Click **Next** to continue.
4. Select the proper item on the **Requirements** screen, and click **Next**.
5. Fill in the fields on the **Company Information** screen, and click **Next**.
6. Accept or change the domain information, and click **Next**.
7. Click **Yes** on the warning message.

NOTE: If you use a routable IP address for the local network adapter, the DHCP service cannot be installed and configured on the server.

8. Make sure the IP address and subnet mask values are correct. Click **Next** to continue.
9. Click **Yes** on the warning message.
10. On the **Logon Information** screen, select **Log on automatically** and enter the password if you do not want to log on every time the server restarts. Otherwise, select **Log on manually**. Click **Next**.
11. On the **Windows Configuration** screen, click **Next** to continue the setup. It may take up to 30 minutes to complete this section.
12. The server will restart after the domain configuration section.
13. After rebooting, the server will continue the setup. If you choose to log on manually in step 10, you will be prompted to enter the password.
14. On the **Component Selection** screen, select the components to install, accept or change the installation path, and click **Next**.
15. On the **Data Folders** screen, accept or change the folders to store data, and click **Next**.
16. Click **Next** on the summary screen to continue.
17. Insert Windows Small Business Server 2003 Disc 2 and Disc 3, and Microsoft Office Outlook 2003 CD when prompted, and following the on-screen instructions to finish the setup.

Section 5. Installing MSM

Please refer to “Installing MSM” in Chapter 13 for the detailed instructions on installing MSM from the Startup CD-ROM.

Section 6. Installing the ZCR Driver

If an optional ZCR card is installed in your server, an appropriate driver is required for the ZCR controller to operate properly. You can create the driver diskette from the *HP Startup CD-ROM* for easy installation.

Creating the Driver Diskette

1. Insert one blank, formatted 3.5" diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.
3. Select the proper driver to install.
4. Follow the on-screen instructions to create the driver diskette.

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Performing the Installation

1. Boot the server from the Windows 2003 CD-ROM.
2. You will see a message that reads, **Setup is inspecting your hardware configuration**. Then the setup screen will be displayed.
3. Always press the **F6** key when the system briefly shows the message of **Press F6 if you need to install a third party SCSI or RAID controller** at the bottom of the display.

NOTE: Unfortunately, Windows 2003 setup only gives you a short time to press the **F6** key. If you miss it, reboot the system and start from step 1 above.

- a. Press the **S** key to specify additional SCSI adapters.
- b. When prompted, insert the ZCR driver diskette you created from the Startup CD-ROM.

- c. Press the **Enter** key to continue.
- d. Select **Adaptec I20 RAID Adapters for 32bit Windows 2000, XP, & 2003**, and then press the **Enter** key.
- e. Press the **S** key to install the ZCR driver from the driver diskette.
- f. Press the **Enter** key to continue.
4. For Windows Small Business Server 2003, press the **Enter** key to continue on the **Setup Notification** screen.
5. Press the **Enter** key to proceed to the **Welcome to Setup** screen. Continue with the standard Windows installation as described in Step 4 of the “Section 1. Performing the Windows 2003 Installation” section earlier in this chapter.

Section 7. Troubleshooting

This section will help you resolve some of the most common installation problems associated with Windows 2003.

Tip #1. Windows 2003 Drivers Signatures

Windows checks for digital signatures on driver files to help maintain system integrity. During the installation or update of a driver, if there is no matching signature file Windows displays a dialog box advising that the driver has not passed “Windows Logo Testing,” the user then has the option to **Continue Anyway** or **Stop Installation**.

- To expedite release of new products, HP may ship drivers without signature files. All Windows drivers provided by Hewlett-Packard are submitted to Microsoft for certification testing. Upon completion of testing, Microsoft produces signature files. HP then posts the revised driver package at <http://www.hp.com/>.
- If a signature warning is displayed during the installation of a driver, you may override the warning. We recommend that you check the HP Website for the latest driver package. If available, install the new driver.
- You can select to have Windows ignore signatures: Click **Start > Control Panel > System > Hardware > Driver Signing**. This is helpful if you are setting up multiple systems.

- Digital signatures are a powerful way to ensure system integrity as you add drivers to your systems - whether provided by HP or others.

Tip #2. Windows 2003 Recovery Options

In the event that the current installation of Windows 2003 fails to boot (this might happen after installing a new driver, component, software, etc), Windows provides the following recovery options to help you gain access to your Windows installation to replace damaged files and services for troubleshooting purposes. HP therefore recommends that you install the Recovery Console (see option 3 below) to enhance the system configuration.

Recovery option #1: Last Known Good Configuration

- Activated by pressing the **F8** key during the system startup process of Windows 2003 and selecting **Last Known Good Configuration** from the menu.
- This boot mode is used in the case that the system fails to boot after installing a new software or driver. The system will use the previous registry setting to initialize and boot the system.

Recovery option #2: Safe Mode Boot

This is activated by pressing the **F8** key during the OS boot. It provides a minimal configuration with required drivers and services. The safe mode boot provides these options:

1. **Safe Mode** – indicates that Windows only loads required files and drivers (i.e. mouse, keyboard, base video, etc.), excluding network services.
2. **Safe Mode with Networking** – indicates Safe Mode that includes basic network services and drivers.
3. **Safe Mode with Command Prompt** – Same as Safe Mode except that a command prompt is started replacing the default user interface.
4. **Enable Boot Logging** – This option outputs the loading of drivers and services by the system to a file. The file (ntbtlog.txt) can be located in the %systemroot% directory. This log file can further assist in determining the exact cause of system startup problems.

5. **Directory Services Restore Mode** – This option is used to assist in restoring the SYSVOL directory and the Active Directory services on a Domain Controller.

Recovery option #3: Recovery Console (RC) Boot

The Recovery Console (RC) can be used when safe boot fails. You can enter RC using one of the following:

- Booting from Windows 2003 CD-ROM
- Installing the RC boot on your system

It is recommended to install the RC immediately after installing Windows 2003.

Start RC Booting from Windows 2003 CD-ROM

If you ever need to boot the Windows 2003 recovery console but this feature is not installed on the system, use the following procedure to boot the RC from the Windows 2003 CD-ROM.

1. Insert the Windows 2003 CD-ROM and start the reboot sequence.
2. Press any key when prompted to start booting from the Windows 2003 CD-ROM.
3. For Windows Small Business Server 2003, press the **Enter** key to continue on the **Setup Notification** screen.
4. Press the **F10** key on the **Welcome to Setup** screen.

NOTE: This is an undocumented option. The bottom of the display will ask you to press the **Enter**, **R**, or **F3** key.

5. The system will display a menu asking to select the instance of the NOS you want to boot. For example:
1: C:\WINDOWS
6. Type 1 and then press the **Enter** key.
7. Type the Administrator password when prompted.
8. At the command prompt type `help` and proceed to achieve your objective.
9. Type `exit` when done troubleshooting.

Installing RC

1. Insert the Windows 2003 CD-ROM. If CD-ROM auto-start is enabled, close the applet.
2. Open a command prompt, and type `D:\I386\WINNT32 /CMDCONS` (Where *D:* is the CD-ROM drive letter).
3. Follow the on-screen instructions to complete the RC installation.

Booting RC

1. Shut down and restart the system.
2. Select **Microsoft Windows Recovery Console** from the OS selection menu and press the **Enter** key.
3. The system will display a menu asking to select the instance of the NOS you want to boot. For example it displays:
`1: C:\WINDOWS`
4. Type 1 and then press the **Enter** key.
5. Type the Administrator password when prompted, and then press the **Enter** key.
6. At the command prompt type `help` and proceed to achieve your objective.
7. Type `exit` when done troubleshooting.

NOTE: The file access security can prevent you from getting to certain files.

Recovery option #4: ASR (Automated System Recovery)

ASR provides a backup of all of the necessary system state data, system services and disks associated with the operating system components. Use ASR as a last resort option, only after the previous mentioned Recovery options have been exhausted.

ASR is a recovery system that contains two parts: **ASR backup** and **ASR restore**.

ASR backup can be accessed through the Automated System Recovery Preparation wizard located in Backup. To access Backup, click **Start > All Programs > Accessories > System Tools > Backup**. Follow the on-screen instructions to create the ASR set.

To access the **ASR restore** mode:

1. Boot from the Windows 2003 CD-ROM.
2. When prompted during the text mode portion of setup, press the **F2** key to initiate Automated System Recovery.
3. Insert the **Windows Automated System Recovery Disk** diskette created from ASR backup.
4. Follow the on-screen instructions to complete the system recovery.

Additional information regarding Automated System Recovery and the other Windows 2003 Recovery options discussed previously can be found within the Help and Support Center of Windows 2003. To access: click **Start > Help and Support**.

Tip #3. Restarting Windows 2003 Installation

If you want to restart the Windows 2003 installation from the very beginning, use a utility such as FDISK to erase all data and partitions from your hard drive. You can then resume the installation process.

Section 8. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- Microsoft World Wide Web access: <http://www.microsoft.com/>
- Microsoft Product Support Services: <http://support.microsoft.com/directory>

Installing Red Hat Linux 9.0 Professional

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following materials:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- Red Hat Linux 9.0 Installation CD-ROMs
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, you need one blank, formatted 3.5-inch diskette to create and install the ZCR driver. Please refer to the “Section 3. Installing the ZCR Driver” section later in this chapter.

High Level Process Flow

1. Performing the Red Hat Linux installation
2. MSHD installation
3. Installing the ZCR driver
4. On-line information and software sources

Section 1. Performing the Red Hat Linux Installation

Booting

1. Boot your new server from the Red Hat 9.0 Professional Installation CD-ROM.
2. When you see the **boot:** prompt, press the **Enter** key.
3. If your correct SCSI controller was correctly detected, you should see a **Loading SCSI Driver** window appear with the name of the SCSI controller in your system.
4. Next, you should see the **Welcome to Red Hat Linux** screen. Click **Next**.

Installation Settings

1. On the **Language Selection** screen, select **English** and click **Next**.
2. On the **Keyboard Configuration** screen, select **U.S. English** and click **Next**.
3. On the **Mouse Configuration** screen, select the appropriate mouse for your system, and click **Next**.
4. On the **Installation Type** screen, choose the type of installation to be performed. Select **Server or Custom**.

Disk Partitioning

1. On the **Disk Partitioning Setup** screen, choose **Manually partition with Disk Druid**. Click **Next**.
2. You may see a warning dialog box pop up that says, “The partition table on device xxx was unreadable, would you like to initialize this drive?” Click **Yes** upon all such dialog boxes.
3. Locate the drive you wish to install to/boot from. If there are existing partitions on this drive, select them and click **Delete**. A warning dialog box will come up to confirm the deletion, click **Delete**. Repeat this for every partition on this drive. Note that the partitions and all data within them will be lost.

4. Create at minimum 3 new partitions for the Linux installation as follows:

Table 4-1: Partitions for Linux Installation

Mount Point	Partition	Type	Size
/boot	Boot Partition	Ext3	100Mb
/	Root Partition	Ext3	2Gb+
swap	Swap Partition	swap	2xRAM size

5. Click **New**.
 - a. For **Mount point**, enter `/boot`.
 - b. Be sure **File System Type:** is set to **ext3**.
 - c. Under **Allowable Drives**, be sure only your boot device is selected. If you do not, you may end up with an installation that spans multiple drives.
 - d. Set “**Size (MB)**” to **100**.
 - e. Be sure **Additional Size Options** is set to **Fixed Size**.
 - f. Select **Force to be a primary partition**.
 - g. Click **OK**.
6. Click **New**.
 - a. Change the **File System Type** to **swap**.
 - b. Be sure that only your boot device is selected under **Allowable Drives**.
 - c. Set **Size (MB)** to the following formula: $\text{size} = (\text{RAM in system}) \times 2$.
 - d. Be sure “**Additional Size Options**” is set to **Fixed Size**.
 - e. Select **Force to be a primary partition**.
 - f. Click **OK**.

7. Click **New**.
 - a. For **Mount Point**, enter `/`.
 - b. Be sure **File System Type**: is set to **ext3**.
 - c. Be sure that only your boot device is selected under **Allowable Drives**.
 - d. Set **Additional Size Options** to **Fill to maximum allowable size**.
 - e. Select **Force to be a primary partition**.
 - f. Click **OK**.
 - g. Click **Next**.

Boot Loader Configuration

1. Click the checkbox for **Configure advanced boot loader options**.
2. Click **Next**.
3. Click **Change Drive Order**.
4. Highlight the drive you are booting to with the mouse and click on the up arrow to move it up to the top of the list. You may need to select the drive and click on the up arrow several times until it is on the top of the list.
5. Click **OK**.
6. You may need to enter special kernel parameters here.
7. Click **Next**.

Network Configuration

NOTE: The installer should have detected all of your NICs at this point. If it does not, then you may need to obtain a special NIC driver that may be installed after you have completed the Red Hat Linux installation.

1. If you are using DHCP, then click `next`. Otherwise, select your first NIC and click `Edit`.

2. If you chose DHCP, you can skip to step 7. Otherwise, deselect **Configure using DHCP**.
3. Enter the IP address and netmask that corresponds to your network. Click **OK**
4. Repeat steps 1 through 3 for each NIC.
5. Select **manually** for **Set the host name** and enter a host name for your machine (e.g., HP-server1).
6. Enter any required addresses for Gateway, Primary, Secondary, and Tertiary DNS.
7. On the **Firewall Configuration** screen, choose the type of firewall configuration, or **No Firewall** for none. If configuring a firewall, you may choose **Use default firewall rules**, or **Customize**. Click **Next** to continue.

NOTE: If you accidentally chose to install a firewall, and did not intend to, you can “rm /etc/rc.d/rc[0-5].d/*iptables*” & “iptables -F” from the root prompt later to get rid of it.

More Installation Settings

1. On the **Additional Language Support** screen, select **English (USA)**. Click **Next**.
2. On the **Time Zone Selection** screen, select your location. Click **Next**.
3. On the **Set Root Password** screen, type in the root password and confirmation. Click **Next** to continue.

Package Group Selection

1. Select the appropriate package groups for your installation. Click **Next** to continue.
2. Click **Next** to begin the installation.
3. The installation should begin. The installation time will vary depending on your hardware configuration. You can monitor the progress from the **Installing Packages** screen. Depending on the packages selected, it may then eject the CD-ROM and prompt you for the next CD-ROM. Insert the next CD-ROM, and click **OK**.

Post Installation Configuration

Boot Diskette Creation

It is recommended to create a boot diskette. If you create a diskette and for some reason your system will not boot on its own, you may be able to boot it from the diskette and try to determine what went wrong. The creation of this diskette is optional.

If you choose to create the diskette, insert a diskette into the flexible diskette drive, select **Yes, I would like to create a boot disk** and click **Next**.

Otherwise select **No, I do not want to create a boot disk** and click **Next**.

Graphical Interface Configuration

In most cases, the installer will have automatically detected your video card configuration by this step. Simply click **Next** to continue.

Monitor Configuration

If the system is connected to a switch box, the installer most likely will not be able to auto probe your monitor type. It is usually safe to just leave it with the default settings of **Unprobed Monitor**, or if it detects your monitor type, to leave it with that. Click **Next**.

Customize Graphics Configuration

If the installer was able to probe your video card successfully, it will most likely pick a good resolution for your system based on the information gathered. In most cases, it will be safe to go with the default.

You will probably want to click **Test Setting** before clicking **Next**, especially if you have graphical selected. If testing the settings works, you may wish to boot in graphical mode. If you do not want to be placed in graphical mode after boot, then select **Text**. Click **Next** to continue.

Welcome

Your installation is complete. You have just installed Red Hat 9.0 Professional. You may now click **Exit** to reboot the system (be sure to remove the installation CD-ROM from the CD-ROM drive).

NOTE: You will receive a **Welcome** screen after rebooting the first time. Select the correct date and time, then choose whether or not to register with the Red Hat Network (Note: this is a subscription service). You can then choose to install additional packages. Click **Forward** to continue.

Click **Forward** on the **Welcome** screen. You will then be brought to the **User Account** screen.

User Account

It is recommended that you create a personal user account for normal (non-administrative) use. To create a personal account, provide the requested information.

Click **Forward** on the **User Account** screen. You will then be brought to the **Date and Time** screen.

Date and Time

Set the date and time for the system.

Click **Forward** on the **Date and Time** screen. You will then be brought to the **Red Hat Network** screen.

Red Hat Network

Choose whether or not to register with the Red Hat Network.

Click **Forward** on the **Red Hat Network** screen. You will then be brought to the **Additional CDs** screen.

Additional CDs

If you have any of the CDs, you can install packages from then by inserting the CD and clicking the appropriate button.

Click **Forward** on the **Additional CDs** screen. You will then be brought to the **Finish Setup** screen.

Finish Setup

Your system is now set up and ready to use. Please click **Forward** in the GUI menu to continue. Then it will enter the login prompt.

Section 2. MSHD Installation

Please refer to “Installing MSHD” in Chapter 13 for the detailed instructions on installing MSHD from the Startup CD-ROM.

Section 3. Installing the ZCR Driver

If an optional ZCR card is installed in your server, an appropriate driver is required for the ZCR controller to operate properly. You can create the driver diskette from the *HP Startup CD-ROM* for easy installation.

Creating the Driver Diskette

1. Insert one blank, formatted 3.5” diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.

3. Select the proper driver to install.
4. Follow the on-screen instructions to create the driver diskette.

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Performing the Installation

1. Boot the server from the Red Hat 9.0 Professional Installation CD-ROM.
2. When you see the **boot:** prompt, enter `linux dd` and press the **Enter** key.
 - a. When the **Do you have a driver disk?** window appears, select **Yes** and press the **Enter** key.
 - b. Select **fd0** for the driver disk source and press the **Enter** key.
 - c. Insert the ZCR driver diskette you created from the Startup CD-ROM.
 - d. Select **OK** and press the **Enter** key to load ZCR driver.
 - e. When the **More Driver Disks?** window appears, select **NO** and press the **Enter** key to continue.
3. Select **OK** to test the CD media before the installation.
 - a. Select **Test** to start testing the CD-ROM.
 - b. Select **OK** after the media check.
 - c. Repeat steps a ~ b to test the other Red Hat Linux 9.0 Professional CD-ROMs.

You can also select **Skip** to skip the test.

4. Press the **Enter** key to proceed to the **Welcome to Red Hat Linux** screen. Continue with the standard Red Hat Linux installation as described in Installation Settings of the “Section 1. Performing the Red Hat Linux Installation” section earlier in this chapter.

Section 4. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- RedHat World Wide Web access: <http://www.redhat.com/>

Installing United Linux 1.0 (SCO Linux 4)

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- United Linux 1.0 CD-ROM #1, #2, and #3
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, the operating system will detect the card and install the driver automatically. The ZCR driver installation procedure is embedded in the standard procedure.

High Level Process Flow

1. Performing the United Linux 1.0 installation
2. MSHD installation
3. On-line information and software sources

Section 1. Performing the United Linux 1.0 Installation

Phase 1 –Launching the Installation

Start the installation using GUI.

1. Turn on the server and insert the United Linux 1.0 bootable CD-ROM.
2. The system will display a graphic menu. Select **Installation** to begin the process of loading the operating system using the graphic interface.

Phase 2 –Configuring the Server

The installation program now displays a graphical interface. You can now proceed through the customization of your installation.

Welcome to YaST2

Default is **English**. Click **Next** to continue.

NOTE: Using the GUI installation, you will have an on-screen description of each possible selection displayed on the left of the screen.

Basic Configuration

Click **Accept** for the **Software License Agreement**. Select **English (US)** for **Select your language**, and then click **Accept**.

Install United Linux

Select **New Installation**. Click **Next** to proceed.

Disk partitioning will vary depending on the type of services the server will provide. The amount of swap space required will also vary depending on the amount of RAM in the system. The following partitioning scheme is given as an example.

1. Select **Change > Partition**.
2. Choose **create custom partition setup**.
3. Select **Custom partitioning –for experts**.
4. Choose **Custom partition**.
 - a. Select **Create**.
 - b. Select **Primary partition**.
 - c. Set the parameters for the boot partition as follows:
Format (file system): `ext2`
Size: Start: 0
End: +20M
Mount point: `/boot`
5. Create a swap partition.
 - a. Select **Create**.
 - b. Select **Primary partition**.
 - c. Set the parameters for the swap partition as follows:
Format (file system): `swap`
Size: Start: `default`
End: 2 x amount of memory in server
Mount point: `swap`
6. Create a root partition.
 - a. Select **Create**.
 - b. Select **Primary partition**.

- c. Set the parameters for the root partition as follows:
Format (file system): `ext2`
Size: Start: `Default`
End: `Default`
Mount point: `/`
7. Click **Next** to proceed.

System Boot Configuration

SuSE Linux uses GRUB as its boot manager. Review and modify as necessary. Click **Next** to continue.

Confirm Installation

1. The installation program will summarize the HDD partitioning information, boot manager installation location as well as the size of software that will be installed. Review, and if this is acceptable, click **Next** to proceed.
2. Click **Yes, install** to proceed with the installation.
3. Insert United Linux Version 1.0 CD 2 when prompted, and then click **OK**.
4. Insert United Linux Installation CD 3 when prompted, and then click **OK**.

Password for “root”

Input a password for “root” access. Because the root user has extensive permissions, the password for “root” should be chosen carefully.

Personalize

Input personal information as necessary. Click **Next** to continue.

Finish Setup

Your system is now set up and ready to use. Please click **Forward** in the GUI menu to continue. Then it will enter the login prompt.

Section 2. MSHD Installation

Please refer to “Installing MSHD” in Chapter 13 for the detailed instructions on installing MSHD from the Startup CD-ROM.

Section 3. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- SCO World Wide Web access: <http://www.sco.com>
- United Linux World Wide Web access: <http://www.unitedlinux.com>
- SuSE World Wide Web access: <http://www.suse.de/en/>

Installing United Linux 1.0 (SuSE Linux Enterprise Server 8)

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- United Linux 1.0 (SuSE Linux Enterprise Server 8) CD-ROMs
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, the operating system will detect the card and install the driver automatically. The ZCR driver installation procedure is embedded in the standard procedure.

High Level Process Flow

1. Performing the United Linux 1.0 installation
2. MSHD installation
3. On-line information and software sources

Section 1. Performing the United Linux 1.0 Installation

Booting

1. Turn on the server and insert the United Linux 1.0 (SuSE Linux Enterprise Server 8) bootable Installation CD-ROM.
2. Select **Installation** to begin the process of loading the operating system.
3. Click **Accept** for the SUSE'S END USER LICENSE FOR SLES.

Language Selection

Select **English (US)** for your language, and click **Accept**. The operating system will start to analyze your system.

Installation Settings

Disk partitioning will vary depending on the type of services the server will provide. The amount of swap space required will also vary depending on the amount of RAM in the system. The following partitioning scheme is given as an example.

1. Select **Change > Partitioning**.
2. The screen displays the suggested partitioning. Select **Create custom partition setup**, and click **Next**.
3. Select **Custom partitioning –for experts**, and click **Next**.

NOTE: If your hard disk is not empty, delete all partitions first.

4. Create a boot partition.
 - a. Select **Create**.
 - b. Select **Primary partition**, and click **OK**.

- c. Set the parameters as follows:
Format (file system): **Ext3**
Size: Start cylinder: 0
End: +20M
Mount point: **/boot**
- d. Click **OK**.
- 5. Create a swap partition.
 - a. Select **Create**.
 - b. Select **Primary partition**, and click **OK**.
 - c. Set the parameters as follows:
Format (file system): **Swap**
Size: Start cylinder: (by default value)
End: (2 x server memory size)
Mount point: **Swap**
 - d. Click **OK**.
- 6. Create a root partition.
 - a. Select **Create**.
 - b. Select **Primary partition**, and click **OK**.
 - c. Set the parameters as follows:
Format (file system): **Ext3**
Size: Start cylinder: (by default value)
End: (by default value)
Mount point: **/**
 - d. Click **OK**.

7. Click **Next** to finish the partitioning schemes.
8. Click **Accept** to proceed.
9. Click **Yes, install** on the warning message to proceed with the installation.

Performing the Installation

1. Insert the SuSE Linux enterprise server 8 UnitedLinux v1.0 CD 1/3 when prompted, and click **OK**.
2. Insert the SuSE Linux enterprise server 8 UnitedLinux v1.0 CD 2/3 when prompted, and click **OK**.
3. Insert the SuSE Linux enterprise server 8 Installation CD when prompted, and click **OK**.
4. The installation of the operating system is complete. The system must reboot. Be sure that the CD-ROM and flexible diskette drives are empty Press the **Enter** key to reboot.
5. Enter a password (at least 5 characters) for the “root” access, and enter it again. Because the root user has extensive permissions, the password for “root” should be chosen carefully. Click **Next** to continue.
6. Enter the personal information as necessary. Click **Next** to continue.
7. Select the current desktop settings for the X-Window system (the default setting is **Graphical desktop environment**). Click **Accept** to continue.

NOTE: The system will detect your printer. If your do not want to detect the printer, click **Skip detection** to continue.

8. The screen will display the configuration information. If you want to change the default settings, click an item, or click **Change** on the bottom and select an item. Then click **Next**.
9. Your system is now set up and ready to use. The system must reboot. Click **OK** to continue, and then the system will enter the login prompt.

Section 2. MSHD Installation

Please refer to “Installing MSHD” in Chapter 13 for the detailed instructions on installing MSHD from the Startup CD-ROM.

Section 3. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- United Linux World Wide Web access: <http://www.unitedlinux.com>
- SuSE World Wide Web access: <http://www.suse.de/en/>

Installing United Linux 1.0 (turbolinux enterprise server 8)

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- United Linux 1.0 (turbolinux enterprise server 8) CD-ROMs
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, the operating system will detect the card and install the driver automatically. The ZCR driver installation procedure is embedded in the standard procedure.

High Level Process Flow

1. Performing the United Linux 1.0 installation
2. MSHD installation
3. On-line information and software sources

Section 1. Performing the United Linux 1.0 Installation

Booting

1. Turn on the server and insert the United Linux 1.0 (turbolinux enterprise server 8) bootable Install CD-ROM.
2. Select **Installation** to begin the process of loading the operating system.
3. Click **Accept** for the turbolinux enterprise server 8 END USER LICENSE AGREEMENT.

Language Selection

Select **English (US)** for your language, and click **Accept**. The operating system will start to analyze your system.

Installation Settings

Disk partitioning will vary depending on the type of services the server will provide. The amount of swap space required will also vary depending on the amount of RAM in the system. The following partitioning scheme is given as an example.

1. Select **Change > Partitioning**.
2. The screen displays the suggested partitioning. Select **Create custom partition setup**, and click **Next**.
3. Select **Custom partitioning –for experts**, and click **OK**.

NOTE: If your hard disk is not empty, delete all partitions first.

4. Create a boot partition.
 - a. Select **Create**.
 - b. Select **Primary partition**, and click **OK**.

- c. Set the parameters as follows:
 - Format (file system): **Ext3**
 - Size: Start cylinder: 0
 - End: +20M
 - Mount point: **/boot**
 - d. Click **OK**.
5. Create a swap partition.
- a. Select **Create**.
 - b. Select **Primary partition**, and click **OK**.
 - c. Set the parameters as follows:
 - Format (file system): **Swap**
 - Size: Start cylinder: (by default value)
 - End: (2 x server memory size)
 - Mount point: **Swap**
 - d. Click **OK**.
6. Create a root partition.
- a. Select **Create**.
 - b. Select **Primary partition**, and click **OK**.
 - c. Set the parameters as follows:
 - Format (file system): **Ext3**
 - Size: Start cylinder: (by default value)
 - End: (by default value)
 - Mount point: **/**
 - d. Click **OK**.

7. Click **Next** to finish the partitioning schemes.
8. Click **Accept** to proceed.
9. Click **Yes, install** on the warning message to proceed with the installation.

Performing the Installation

1. Insert the turbolinux enterprise server 8 Disk 1 Install CD when prompted, and click **OK**.
2. Insert the turbolinux enterprise server 8 Disk 2 UnitedLinux v1.0 Binary CD1 when prompted, and click **OK**.
3. Insert the Turbolinux enterprise server 8 Disk 1 Install CD again when prompted, and click **OK**.
4. The installation of the operating system is complete. The system must reboot. Be sure that the CD-ROM and flexible diskette drives are empty. Press the **Enter** key to reboot.
5. Enter a password (at least 5 characters) for the “root” access, and enter it again. Because the root user has extensive permissions, the password for “root” should be chosen carefully. Click **Next** to continue.
6. Enter the personal information as necessary. Click **Next** to continue.
7. Select the current desktop settings for the X Window System (the default setting is **Graphical desktop environment**). Click **Accept** to continue.

NOTE: The system will detect your printer. If you do not want to detect the printer, click **Skip detection** to continue.

8. The screen will display the configuration information. If you want to change the default settings, click an item, or click **Change** on the bottom and select an item. Then click **Next**.
9. Your system is now set up and ready to use. The system must reboot. Click **OK** to continue, and then the system will enter the login prompt.

Section 2. MSHD Installation

Please refer to “Installing MSHD” in Chapter 13 for the detailed instructions on installing MSHD from the Startup CD-ROM.

Section 3. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- United Linux World Wide Web access: <http://www.unitedlinux.com>
- Turbo Linux access: <http://www.turbolinux.com>

Installing Turbolinux 8 Server

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- One blank, formatted 3.5-inch diskette (Optional)
- Turbolinux 8 Server CD-ROM
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, the operating system will detect the card and install the driver automatically. The ZCR driver installation procedure is embedded in the standard procedure.

High Level Process Flow

1. Performing the Turbolinux 8 Server installation
2. MSHD installation
3. On-line information and software sources

Section 1. Performing the Turbolinux 8 Server Installation

Booting

1. Turn on the server and insert the Turbolinux 8 Server CD-ROM.
2. On boot prompt, press the **Enter** key.
3. After loading the SCSI driver, select a language (**English** as the default setting) and press the **Enter** key to begin the installation.

Installing the Operating System

1. Accept the default setting for the type of the installation, and click **Next**.
2. Select the type of your keyboard, and click **Next**.
3. Select the type of your mouse, and click **Next**.
4. Select the destination for the installation.
5. Click **Automatic partitioning** to configure the partition automatically.

Or, if you are not using an empty hard disk, click **TFDisk** to configure partition manually by the following procedure:

- a. Click **Remove All** to remove the partition, and click **OK**.
- b. Select **DOS Free**, and click **Add a partition**, then **OK**.

Set the parameters as follows:

Partition Type: **Linux ext3**

Mount Point: **/boot**

Size(in megabytes): (by default value)

Click **OK**.

- c. Select **DOS Free**, and click **Add a partition**, then **OK**.

Set the parameters as follows:

Partition Type: **Linux swap**

Mount Point: **swap**

Size(in megabytes): (2 x server memory size)

Click **OK**.

- d. Select **DOS Free**, and click **Add a partition**, then **OK**.

Set the parameters as follows:

Partition Type: **Linux ext3**

Mount Point: **/**

Size(in megabytes): (by default value)

Click **OK**.

- e. Click **Next** to continue.

- f. When the “Choose partitions to format” message appears, click **OK**.

6. Uncheck the **Create boot disk** item if you do not want to create a boot disk. Make sure to check the **Install boot loader** item. Accept the default setting for the destination of the boot loader. Then click **Next**.
7. Configure your network now. If you want to allocate the network, uncheck the **Configure using DHCP** item and enter your network configuration. Make sure the **Activate on boot** item is checked. Then click **Next**.

NOTE: If the **Activate on boot** item is checked but the server is not connected to a network, the server will take a few more minutes when rebooting after the installation.

8. Set the time zone (America/New York as the default setting), and click **Next**. Default is America/New York.
9. Enter the root password (at least 6 characters) and re-enter it. Click **Next**.

NOTE: The screen will display **Not matched** when you re-enter the wrong password.

10. Select the type of the installation, and click **Next**.
11. Select the manufacturer and model for your monitor, and click **Next**.
12. Configure your X Windows settings, and click **Next**.

NOTE: You can click **Test this configuration** to test your configuration.

13. The system will display the configuration information. Click **Next**.
14. Click **OK** on the warning message to start the installation.
15. After the installation, you can install additional packages from the CD-ROM. If you do not want to install additional packages, check the **Skip additional package installation** item and click **Next**.
16. Select a desired security level, and click **Next**.
17. If the **Create boot disk** item is checked in step 1, insert one blank, formatted 3.5" diskette. Or, check the **Skip creating boot disk** item, and click **Next**.
18. The installation of Turbolinux 8 Server is complete. Click **Finish**.
19. Make sure that the CD-ROM and flexible diskette drives are empty. Press the **Enter** key to reboot the server.
20. Your system is now set up and ready to use. It will enter the login prompt. Enter "root" for the user name, and the root password to log in the system. Then type `startx` to use X.

Section 2. MSHD Installation

Please refer to "Installing MSHD" in Chapter 13 for the detailed instructions on installing MSHD from the Startup CD-ROM.

Section 3. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- Turbolinux World Wide Web access: <http://www.turbolinux.co.jp>

Installing Red Flag Linux 4.0 Advanced Server

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- One blank, formatted 3.5-inch diskette (Optional)
- Red Flag Linux 4.0 Professional Server CD-ROM
- Red Flag Linux 4.0 Advanced Server CD-ROM
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, the operating system will detect the card and install the driver automatically. The ZCR driver installation procedure is embedded in the standard procedure.

High Level Process Flow

1. Performing the Red Flag Linux 4.0 installation
2. MSHD installation
3. On-line information and software sources

Section 1. Performing the Red Flag Linux 4.0 Installation

NOTE: You must install Red Flag Linux 4.0 Professional Server first, and then Red Flag Linux 4.0 Advanced Server.

Installing Red Flag Linux 4.0 Professional Server

1. Turn on the server and insert the Red Flag Linux 4.0 Professional Server bootable CD-ROM.
2. After loading the SCSI driver, click 同意 (**Agree**) for the Red Flag Linux Software Agreement V1.1. Then click 下一步 (**Next**).
3. Select 典型安装 (**Typical Installation**), and click 下一步 (**Next**) to proceed.
4. Disk partitioning will vary depending on the type of services the server will provide. The amount of swap space required will also vary depending on the amount of RAM in the system. The following partitioning scheme is given as an example.
 - a. Select 用 Disk Druid 手工分区 (**Manually partition with Disk Druid**), and then click 下一步 (**Next**).
 - b. Select 空闲 (**Free Space**), and then select 新建 (**New**) to create a swap partition.

Set the parameters as follows:

挂载点 (Mount Point): (by default value)

文件系统类型 (file system): **swap**

大小 (Size) (MB): (2 x server memory size)

Then click 确定 (**OK**) to continue.

- c. Select **空闲 (Free Space)** again, and then select **新建 (New)** to create a root partition.

Set the parameters as follows:

挂载点 (Mount Point): /

文件系统类型 (file system): **ext3**

大小 (Size) (MB): check the **使用全部可用空间 (Fill to maximum allowable size)** item.

Then click **确定 (OK)** to continue.

5. Click **下一步 (Next)**.
6. Accept the default setting for **引导记录安装位置 (Install Boot Loader record on)**. Click **下一步 (Next)** to continue.
7. The installation program will summarize the HDD partitioning information, boot manager installation location as well as the size of software that will be installed. Review, and if this is acceptable, click **下一步 (Next)** to proceed.
8. Enter a password for “root” access, and re-enter it to confirm. Because the root user has extensive permissions, the password for “root” should be chosen carefully. Click **下一步 (Next)** to continue.
9. Click **下一步 (Next)** to start the installation. After the installation, the system will reboot.
10. After rebooting, the installation logs will be saved in the directory of /root/install.log, and the installation configurations will be saved in the directory of /root/anaconda-ks.cfg.
11. If you want to create a boot diskette, uncheck the **跳过创建引导盘 (Skip Boot Diskette Creation)** item, insert one blank, formatted 3.5” diskette, and click **下一步 (Next)**.

Otherwise, check the **跳过创建引导盘 (Skip Boot Diskette Creation)** item, and click **下一步 (Next)**.

12. The installation of Red Flag Linux 4.0 Professional Server is finished. Make sure that the CD-ROM and flexible diskette drives are empty. Click **下一步 (Next)** to reboot the system.
13. Your system is now set up and ready to use. It will enter the login prompt. Enter “root” for the login name, and the root password. Then type `startx` to start X-Windows.

Installing Red Flag Linux 4.0 Advanced Server

1. Insert the Red Flag Linux 4.0 Advanced Server bootable CD-ROM, and then click **下一步 (Next)** to continue.
2. Enter the license information, and then click **下一步 (Next)** to continue.

NOTE: Be careful when typing the license; it is case-sensitive.

3. Click **下一步 (Next)** to install Red Flag Linux 4.0 Advanced Server.
4. The installation of Red Flag Linux 4.0 Advanced Server is finished. Make sure that the CD-ROM and flexible diskette drives are empty. Then select **立即重启计算机 (Reboot the server now)** and click **完成 (Finish)** to reboot the system.
5. Your system is now set up and ready to use. It will enter the login prompt. Enter “root” for the login name, and the root password. Then type `startx` to start X-Windows.

Section 2. MSHD Installation

Please refer to “Installing MSHD” in Chapter 13 for the detailed instructions on installing MSHD from the Startup CD-ROM.

Section 3. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- Red Flag access: <http://www.redflag.com/>

Installing SCO Open UNIX 8

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- One blank, formatted 3.5-inch diskette
- SCO Open UNIX 8 (Release 8.0.0) CD-ROMs
- Two or more clients for testing purposes (Optional)

NOTE: SCO Open UNIX 8 does not support the USB mouse. If you want to use a mouse, use a PS-2 or serial mouse.

NOTE: SCO Open UNIX 8 does not support the ZCR card.

High Level Process Flow

1. Creating the driver diskette using the *HP Startup CD-ROM*
2. Performing the SCO Open UNIX 8 installation
3. Enabling the second processor
4. MSHD-U installation
5. On-line information and software sources

Section 1. Creating the Driver Diskette

1. Insert one blank, formatted 3.5" diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.
3. Select the proper driver to install.
4. Follow the on-screen instructions to create the SCO Open UNIX 8 AIC-7902W SCSI driver diskette (HP ProLiant ML150 SCO Open UNIX 8 SCSI drivers diskette).

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Section 2. Performing the SCO Open UNIX 8 Installation

Booting

1. Turn on the server and insert the Base Operating System CD 1 - RELEASE 8.0 Disk 1 of 4.
2. The system will display a graphic menu. Default is **Proceed with installation in English**. Press the **Enter** key to continue.
3. Press the **F10** key on the welcome screen to continue.

Basic Configuration

1. Select **Americas (Latin-1)** for your zone, and press the **F10** key.
2. Select **C (English)** for your locale, and press the **F10** key.
3. Select **United States** for your keyboard, and press the **F10** key.
4. Enter the license information from your registration card (or request it through an online form), and then press the **F10** key.

Installing the SCSI Driver

1. Insert the SCO Open UNIX 8 AIC-7902W SCSI driver (HP ProLiant ML150 SCO Open UNIX 8 SCSI drivers) diskette you created from the *HP Startup CD-ROM*. Select **Install HBA diskette** and press the **F10** key to load the diskette.
2. After loading the diskette, select **Proceed with installation**, and press the **F10** key.

Installing the Operating System

1. Select **Do not enter the DCU (auto-configure drivers)**, and press the **F10** key.
2. Enter the node name for your system, and press the **F10** key.
3. Select **Install from CD-ROM**, and press the **F10** key.
4. Press the **F2** key to select **Customize partitions** for disk configuration, and press the **Enter** key.

On the **Disk 1 Partitions** page, configure the following settings:

- a. Press the **F2** key to select **UNIX System** in the Type field, and press the **Enter** key.

NOTE: The system must have one UNIX system partition.

- b. Press the **Tab** key to move to the Status field, and press the **F2** key to select the **Active** option.

NOTE: The UNIX system partition must be set to **Active**.

- c. Press the **Tab** key to move to the % field, and enter the percentage value (for example, 10) of the UNIX system on your hard disk.
- d. Press the **Tab** key to move to the Size field, and the system will automatically calculate the specified size of the hard disk.

NOTE: The UNIX system partition must be at least 80MB.

- e. Press the **F10** key to return to the **Customize partitions** page.

5. Press the **F10** key.
6. Select **Use Default filesystem sizes and types**, and press the **F10** key.
7. Select **Use default disk options**, and press the **F10** key.
8. Select **License-Based Defaults**, and press the **F10** key.
9. Select **Defer network configuration**, and press the **F10** key.
10. Enter the date and time values. Or, if date and time settings are correct, press the **F10** key.
11. Select a desired security level, and press the **F10** key.
12. Enter the system owner's information:
 - a. Type the owner's name, and press the **Enter** key.
 - b. Type the owner's login ID, and press the **Enter** key.
 - c. Type the owner's user ID (UID) number, and press the **Enter** key. Default is **101**.
 - d. Type the owner's password, and press the **Enter** key.
 - e. Type the password again, and press the **F10** key.
13. Enter the root password, press the **Enter** key to re-enter it, and then press the **F10** key.
14. Select **Accept**, and press the **F10** key to accept the license agreement.
15. Press the **F10** key to install the operating system.
16. Re-insert the SCO Open UNIX 8 AIC-7902W SCSI driver (HP ProLiant ML150 SCO Open UNIX 8 SCSI drivers) diskette you created from the *HP Startup CD-ROM* to install the SCSI driver, and press the **Enter** key.
17. After the installation is finished, make sure that the CD-ROM and flexible diskette drives are empty. Then press the **Enter** key, and the system will shut down and restart.

18. After rebooting, select the type of mouse, and then press the **F10** key.
If your selection is not the **No Mouse** option, then you need to enter the number of buttons and click any of the mouse buttons to test if the mouse is working properly.
19. Insert the Base Operating System CD 2/ Upgrade CD CD 2 - RELEASE 8.0 Disk 2 of 4, and press the **F10** key to continue.
20. Select the products to install and press the **Enter** key.
21. After installing the selected product(s), press the **F10** key.
22. Insert the Linux RPM CD CD4 - RELEASE 8.0 Disk 4 of 4, and then press the **F10** key.
23. Select one of the profiles and press the **Enter** key.
24. After installing the selected profile, press the **F10** key.
25. Insert the Optional Services CD CD3 - RELEASE 8.0 Disk 3 of 4, and then press the **F10** key.
26. Select products and press the **Enter** key to install.

NOTE: If you want to install **ReliantHA Host Monitoring Software** or **Merge 5.5.1**, you need to buy licenses for these two products.
27. After the installation is complete, press the **F10** key.
28. The system will be rebuilt kernel and reset.
29. Your system is now set up and ready to use. It will enter the login prompt. Enter "root" for the user name and the root password. Double-click the **dtterm** icon to continue.

Installing the Network Driver

1. Insert the Startup CD-ROM and mount the CD-ROM.

```
# mount /dev/cdrom/cdrom1 /mnt
```
2. Copy the e1008g.pkg file to any directory, like /tmp.

```
# cp /mnt/drivers/ou8uw7x1/e1008g.pkg /tmp
```
3. Make sure that no other users log on the system, and all user applications are closed.
4. If there is an older version of the e1008g driver on the system (to find out the driver version, type `pkginfo -l e1008g`):
 - a. Run `netcfg` and remove any configured NICs.
 - b. Exit `netcfg`.
 - c. Remove the old driver by typing `pkgrm e1008g`.
5. Install the new driver using `pkgadd`.

```
# pkgadd -d /tmp/e1008g.pkg
```

Press the **Enter** key, and then press the **Y** key then the **Enter** key to confirm the installation.
6. Run `netcfg` to add and configure the NICs.
 - a. On the pop-up window, click **Hardware > Add new LAN adapter**.
 - b. Select **Ethernet-Intel(R) PRO/1000 MT Network Connection (DDI 8)(7.2.10)-PCI Slot 0 Bus 4 Device 1 Function 0**.
 - c. Click **Continue > OK**
 - d. On the **Add protocol** window, click **Add**.
 - e. Enter your network settings and click **OK**.
 - f. On the **Configure networking product** window, click **OK**.
 - g. Click **Hardware > Exit** to exit `netcfg`.
7. Type `shutdown -y now` and press the **Enter** key to reboot the system.

Section 3. Enabling the Second Processor

If a second processor is installed in your server, then you must install an additional OS Multiprocessor Support (OSMP) package to enable this second processor in SCO Open UNIX 8.

1. Turn on the server and log in the system as “root.”
2. Insert the Base Operating System CD 1 - RELEASE 8.0 Disk 1 of 4.
3. Run the terminal program. When the window displays, mount the CD-ROM.

```
# mount /dev/cdrom/cdrom1 /mnt
```
4. Install the OSMP package to the SCO Open UNIX 8 system.

```
# pkgadd -d /mnt osmp
```
5. When the **Choose Platform Support Module** window appears, press the **Enter** key.
6. Umount the CD-ROM and remove it from the CD-ROM drive after the installation of the OSMP package is finished.

```
# umount /mnt
```
7. Insert the Base Operating System CD 2/ Upgrade CD CD 2 - RELEASE 8.0 Disk 2 of 4.
8. Mount the CD-ROM.

```
# mount /dev/cdrom/cdrom1 /mnt
```
9. Install the UpdateSet package to the SCO Open UNIX 8 system.

```
# pkgadd -d /mnt UpdateSet
```
10. Umount the CD-ROM and remove it from the CD-ROM drive after the installation of the UpdateSet package is finished.

```
# umount /mnt
```
11. Shut down and reboot the server.

```
# shutdown -y -g0 -i6
```

The second processor is now ready to use in your server.

Section 4. MSHD-U Installation

Please refer to “Installing MSHD-U” in Chapter 13 for the detailed instructions on installing MSHD-U from the Startup CD-ROM.

Section 5. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- SCO World Wide Web access: <http://www.sco.com>

Installing SCO UnixWare 7

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- One blank, formatted 3.5-inch diskette
- SCO UnixWare 7 (Release 7.1.3) CD-ROMs
- Two or more clients for testing purposes (Optional)

NOTE: SCO UnixWare 7 (Release 7.1.3) does not support the ZCR card.

High Level Process Flow

1. Creating the driver diskette using the *HP Startup CD-ROM*
2. Performing the SCO UnixWare 7 installation
3. Enabling the second processor
4. MSHD-U installation
5. On-line information and software sources

Section 1. Creating the Driver Diskette

1. Insert one blank, formatted 3.5" diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.
3. Select the proper driver to install.
4. Follow the on-screen instructions to create the SCO UnixWare 7 AIC-7902W SCSI driver diskette (HP ProLiant ML150 SCO Unixware 7.1.3 SCSI drivers diskette).

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Section 2. Performing the SCO UnixWare 7 Installation

Booting

1. Turn on the server and insert the UnixWare 7.1.3 Base Operating System Disk 1 of 4.
2. The system will display a graphic menu. Default is **Proceed with installation in English**. Press the **Enter** key.
3. Press the **F10** key on the welcome screen to continue.

Basic Configuration

1. Select **Americas (Latin-1)** for your zone, and press the **F10** key.
2. Select **C (English)** for your locale, and press the **F10** key.
3. Select **United States** for your keyboard, and press the **F10** key.
4. Enter the license information from your registration card (or request it through an online form), and then press the **F10** key.

Installing the SCSI Driver

1. Insert the SCO UnixWare 7 AIC-7902W SCSI driver (HP ProLiant ML150 SCO Unixware 7.1.3 SCSI drivers) diskette you created from the *HP Startup CD-ROM*. Select **Install HBA diskette** and press the **F10** key to load the diskette.
2. After loading the diskette, select **Proceed with installation**, and press the **F10** key.

Installing the Operating System

1. Select **Do not enter the DCU (auto-configure drivers)**, and press the **F10** key.
2. Enter the node name for your system, and press the **F10** key.
3. Select **Install from CD-ROM**, and press the **F10** key.
4. Press the **F2** key to select **Customize partitions** for disk configuration, and press the **Enter** key.

On the **Disk 1 Partitions** page, press the **F2** key to select **UNIX System**, and press the **Enter** key. Then press the **F9** key.

5. Press the **F10** key.
6. Select **Use default filesystem sizes and types**, and press the **F10** key.
7. Select **Use default disk options**, and press the **F10** key.
8. Select **License-Based Defaults**, and press the **F10** key.
9. Select **Use the detected adapter shown above**, and press the **F10** key.
10. On the Configure Networking Hardware page, press the **F2** key to select **Auto_Auto** for **Adapter DuplexMode/Speed**, and press the **Enter** key.
11. Press the **F10** key, and enter your network configuration, and then press the **F10** key. Or, press the **F8** key to defer the configuration.
12. Enter the date and time values. Or, if date and time settings are correct, press the **F10** key.
13. Select a desired security level, and press the **F10** key.

14. Enter the system owner's information:
 - a. Type the owner's name, and press the **Enter** key.
 - b. Type the owner's login ID, and press the **Enter** key.
 - c. Type the owner's user ID (UID) number, and press the **Enter** key. Default is **101**.
 - d. Type the owner's password, and press the **Enter** key.
 - e. Type the password again, and press the **F10** key.
15. Enter the root password, press the **Enter** key to re-enter it, and then press the **F10** key.
16. Select **Accept**, and press the **F10** key to accept the license agreement.
17. Press the **F10** key to install the operating system.
18. After the installation is finished, make sure that the CD-ROM and flexible diskette drives are empty. Then press the **Enter** key, and the system will shut down and restart.
19. After rebooting, select the type of mouse, and then press the **F10** key.

If your selection is not the **No Mouse** option, then you need to enter the number of buttons (not when you use a USB mouse) and click any of the mouse buttons to test if the mouse is working properly.
20. Insert the UnixWare 7.1.3 Base Operating System Disk 2 of 4, and press the **F10** key.
21. Select **Linux Kernel Personality for UnixWare 7** and press the **F10** key to install.
22. After installing the selected product(s), press the **F10** key.
23. Insert the UnixWare 7.1.3 Base Operating System Disk 3 of 4, and press the **F10** key.
24. Select one of the products that you want to install, and press the **F10** key. Or, press the **F8** key to defer the products installation.

25. Insert the UnixWare 7.1.3 Base Operating System Disk 4 of 4, and press the **F10** key.
26. Select one of the profiles, and press the **Enter** key.
27. The installation of the Linux Kernel Personality for UnixWare is complete. Press the **Enter** key or the **F10** key to continue.
28. Press the **F10** key to continue for the information page.
29. Your system is now set up and ready to use. It will enter the login prompt. Enter "root" for the user name and the root password. Double-click the **dtterm** icon to continue.

Installing the Network Driver

1. Insert the Startup CD-ROM and mount the CD-ROM. For example:

```
# mount /dev/cdrom/cdrom1 /mnt
```
2. Copy the e1008g.pkg file to any directory, like /tmp. For example:

```
# cp /mnt/drivers/ou8uw7xl/e1008g.pkg /tmp
```
3. Make sure that no other users log on the system, and all user applications are closed.
4. If there is an older version of the e1008g driver on the system (to find out the driver version, type `pkginfo -l e1008g`):
 - a. Run `netcfg` and remove any configured NICs.
 - b. Exit `netcfg`.
 - c. Remove the old driver by typing `pkgrm e1008g`.
5. Install the new driver using `pkgadd`. For example:

```
# pkgadd -d /tmp/e1008g.pkg
```

Press the **Enter** key, and then press the **Y** key then the **Enter** key to confirm the installation.

6. Run `netcfg` to add and configure the NICs.
 - a. On the pop-up window, click **Hardware > Add new LAN adapter**.
 - b. Select **Ethernet-Intel(R) PRO/1000MT Network Connection (DDI 8)(7.2.10)-PCI Slot 0 Bus 4 Device 1 Function 0**, and click **Continue**.
 - c. On the **Network Driver Configuration** window, click **OK**.
 - d. On the **Add protocol** window, select **TCP/IP** and click **Add**.
 - e. On the **Internet Protocol Configuration** window, click **Yes** (or **No** to configure the settings) for the DHCP client, and then click **OK**.
 - f. On the **Configure networking product** window, click **OK**.
 - g. Click **Hardware > Exit** to exit `netcfg`.
7. Type `shutdown -y now`, and press the **Enter** key to reboot the system.

Section 3. Enabling the Second Processor

If a second processor is installed in your server, then you must install an additional OS Multiprocessor Support (OSMP) package to enable this second processor in SCO UnixWare 7.

1. Turn on the server and log in the system as “root.”
2. Insert the UnixWare 7.1.3 Base Operating System Disk 1 of 4.
3. Run the terminal program. When the window displays, mount the CD-ROM.

```
# mount /dev/cdrom/cdrom1 /mnt
```
4. Install the OSMP package to the SCO UnixWare 7 system.

```
# pkgadd -d /mnt osmp
```
5. When the **Choose Platform Support Module** window appears, press the **Enter** key.

6. Umount the CD-ROM and remove it from the CD-ROM drive after the installation of the OSMP package is finished.

```
# umount /mnt
```

7. Shut down and reboot the server.

```
# shutdown -y -g0 -i6
```

The second processor is now ready to use in your server.

Section 4. MSHD-U Installation

Please refer to “Installing MSHD-U” in Chapter 13 for the detailed instructions on installing MSHD-U from the Startup CD-ROM.

Section 5. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- SCO World Wide Web access: <http://www.sco.com>

Installing SCO OpenServer 5.0.7

Preparing the Installation

Please refer to “Preparing the Server for NOS Installation” in Chapter 1 for recommendations on server preparation. Then gather the following material:

- The *HP Startup CD-ROM* for the HP ProLiant ML150 server
- One blank, formatted 3.5-inch diskette
- SCO OpenServer 5.0.7 CD-ROM
- Two or more clients for testing purposes (Optional)

NOTE: If an optional ZCR card is installed in the server, you need one blank, formatted 3.5-inch diskette to create and install the ZCR driver. Please refer to the “Section 5. Installing the ZCR Driver” section later in this chapter.

High Level Process Flow

1. Creating the driver diskette using the *HP Startup CD-ROM*
2. Performing the SCO OpenServer 5.0.7 installation
3. Enabling the second processor
4. MSHD-O installation
5. Installing the ZCR driver
6. On-line information and software sources

Section 1. Creating the Driver Diskette

1. Insert one blank, formatted 3.5" diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.
3. Select the proper driver to install.
4. Follow the on-screen instructions to create the (ad320) package BTLD diskette (HP ProLiant ML150 SCO OpenServer 5.0.7 SCSI drivers diskette).

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Section 2. Performing the SCO OpenServer 5.0.7 Installation

Booting

1. Turn on the server and insert the Base Operating System installation CD-ROM.
2. On boot prompt, type link after the prompt as shown below:

```
boot: defbootstr link="ad320"
```

Press the **Enter** key.
3. When the "Please insert the fd(65)/ad320 volume and press <Return>, or 'q' to quit:" message appears, insert the (ad320) package BTLD diskette you created from the *HP Startup CD-ROM*, and press the **Enter** key.
4. After loading the SCSI driver, press the **Enter** key to start the installation.

Installing the Operating System

1. Insert the (ad320) package BTLD diskette (HP ProLiant ML150 SCO OpenServer 5.0.7 SCSI drivers diskette), and press the **Enter** key.
2. When the RESTRICTED RIGHTS LEGEND message appears, press the **Enter** key.
3. Select **Accept** upon the End User License Agreement (EULA), and press the **Enter** key.
4. Select the installation media device. Press the direction keys to move between the items, and the **Space Bar** to change the setting for each item.

Media device to be used: **IDE CD ROM**

IDE Controller: **primary**

Master or Slave: **master**

Then select **Accept above choices**, and press the **Enter** key.

5. Make sure that the Base Operating System installation CD-ROM is inserted. Select **OK** and press the **Enter** key.
6. Select the keyboard type by pressing the **Space Bar**. Then select **Accept above choices**, and press the **Enter** key.
7. Enter the license number and license code. Then select **Accept above choices**, and press the **Enter** key.
8. Select **Fresh** and then press the **Enter** key.
9. Select **OK**, and press the **Enter** key to start the configuration.
10. Enter the information if the default settings do not match your requirements. Then select **Accept above choices**, and press the **Enter** key.
11. Select the system profile. Then select **Accept above choices**, and press the **Enter** key.
12. Select **Hard disk setup** and **Optional software**. Then select **Accept above choices**, and press the **Enter** key.

13. Configure the optional software settings. Press the direction keys to move between the items, and the **Space Bar** to change the setting for each item.

Network card: **Deferred**

Network address: **No networking card configured**

Video and graphics: **VESA SVGA**

Mouse: (Select the type of your mouse.)

Email system: **MMDF**

Then select **Accept above choices**, and press the **Enter** key.

14. Enter the root password, and re-enter it to confirm. Then select **Accept above choices**, and press the **Enter** key.
15. Select **OK**, and press the **Enter** key to start the installation.
16. Press the **Enter** key when prompted.
17. After the installation, press the **Enter** key repeatedly until the Safe to Power Off message appears. Press any key to reboot the system.
18. Upon the boot prompt, press the **Enter** key to boot.

NOTE: Before booting, make sure that the CD-ROM and flexible disk drives are empty.

19. Press the **Ctrl-D** keys when prompted to proceed with the normal startup.
20. Enter the new time value, or press the **Enter** key to accept the default setting.
21. Your system is now set up and ready to use. It will enter the login prompt. Enter "root" for the login ID and the root password. Double-click the **UNIX** icon to continue.

Install the Network Driver

1. Insert the Startup CD-ROM and mount the CD-ROM. For example:

```
# mount /dev/cd0 /mnt
```

As the system is mounting a read-only CD-ROM, an error message may appear. Click **Close** to continue.

2. Make sure that no other users log on the system, and all user applications are closed.
3. Copy the eeG.vol file to any directory, like /tmp, on the SCO system, and then rename the file as VOL.000.000. Use the `chmod` command to make it a read-only file.

```
# cp /mnt/drivers/osr5071/eeG.vol /tmp/VOL.000.000
# chmod 444 /tmp/VOL.000.000
```
4. If there is an older version of the eeG driver on the system, you must first remove it:
 - a. Run `netconfig`.
 - b. Remove all drivers of the “Intel PRO/1000...” adapter(s).
 - c. Exit `netconfig` and select not to relink the kernel.
 - d. Run `Custom` and remove the previous version of the Intel(R) PRO/1000 Network drivers.
5. To install the new driver:
 - a. Run `custom`.
 - b. On the pop-up window, click **Software > Install New**.
 - c. Select **From scosysv** and click **Continue**.
 - d. Select **Media Images** for the installation media, and click **Continue**.

- e. Type the directory path to the VOL.000.000 file.
For example, if you copied the file to /tmp in step 3, type /tmp.
Click **OK**.
- f. Click **Install** to start the installation.
- g. After the installation is complete, click **OK**, and then exit `custom`.
6. To add the adapters:
 - a. Run `netconfig`.
 - b. Click **Hardware > Add new LAN adapter**, and click **Continue**.
 - c. Select **SCO TCP/IP** and click **Add** to enter the SCO TCP/IP Configuration.
 - d. Enter the information and click **OK**.
By default, the driver automatically detects the line speed and duplex mode.
If you want to modify any of these settings, select **Advanced Options** and set the speed and duplex modes.
 - e. Click **OK** on the **Configure Networking product** window.
 - f. Exit `netconfig` and.
 - g. Click **Yes** to re-link the kernel.
You need to press the **Y** key and then the **Enter** key to confirm. Then press the **Y** key and then the **Enter** key again to re-build the kernel environment.
 - h. Press the **Enter** key to continue.
7. Type `reboot` to reboot the system.

NOTE: This driver supports 82544, 82540, 82545, 82546, 82541, and 82547 MAC based devices. Legacy adapters based on the 82542 and 82543 MAC controllers are NOT supported by this driver. If any of these legacy devices, or any other devices are recognized by this driver, it is advised NOT to configure them.

Section 3. Enabling the Second Processor

If a second processor is installed in your server, then you must install the specified software to enable this second processor in SCO OpenServer 5.0.7.

1. Turn on the server and log in the system as “root.”
2. Insert the Base Operating System installation CD-ROM.
3. Run the terminal program. When the window displays, mount the CD-ROM.

```
# mount /dev/cd0 /mnt
```
4. Start the Software Manager program by typing:

```
# custom
```
5. Select the **Software** tab from the menu, and press the **Enter** key.
6. Select the **Install New** item, and press the **Enter** key.
7. Select **From scosysv**, then **Continue**, and press the **Enter** key.
8. Select **CD-ROM Drive 0**, then **Continue**, and press the **Enter** key.
9. Select **SCO Symmetrical Multiprocessing (ver 1.1.1Hw)** to install.
10. Enter the license number, license code and license data, and press the **Enter** key.
11. After the installation, you can find the SCO Symmetrical Multiprocessing (ver 1.1.1Hw) software from the menu.
12. Exit the Software Manager program and reboot the server.

The second processor is now ready to use in your server.

Section 4. MSHD-O Installation

Please refer to “Installing MSHD-O” in Chapter 13 for the detailed instructions on installing MSHD-O from the Startup CD-ROM.

Section 5. Installing the ZCR Driver

If an optional ZCR card is installed in your server, an appropriate driver is required for the ZCR controller to operate properly. You can create the driver diskette from the *HP Startup CD-ROM* for easy installation.

Creating the Driver Diskette

1. Insert one blank, formatted 3.5" diskette into the flexible diskette drive of a PC running Microsoft Windows.
2. Insert the *HP Startup CD-ROM* into the CD-ROM drive of the above PC and click **HP ProLiant ML150 drivers** on the **Startup** menu.
3. Select the proper driver to install.
4. Follow the on-screen instructions to create the driver diskette.

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the Startup CD-ROM.

Performing the Installation

1. Boot the server from the SCO OpenServer 5.0.7 Base Operating System installation CD-ROM.
2. On the boot: prompt, type the link after the prompt as shown below:
`Boot: defbootstr link=dpti5`
3. When the **Please insert the fd(65)dpti5 volume and press <Return>, or 'q' to quit:** message appears, insert the driver diskette into the flexible disk drive, and press the **Enter** key.
4. After loading the ZCR driver, press the **Enter** key to start the installation. Continue with the standard SCO OpenServer 5.0.7 installation as described in the "Installing the Operating System" section earlier in this chapter.

Section 6. On-Line Information and Software Sources

- HP World Wide Web access: <http://www.hp.com/>
- SCO World Wide Web access: <http://www.sco.com>

Management and Diagnostics Tools

HP ML150 System Monitor (MSM)

NOTE: The HP ML150 System Monitor (MSM) is available for Windows 2000 and Windows 2003 only.

The HP ML150 System Monitor (MSM) is a browser-based management software that provides remote administration and monitoring of server components, as well as some of the critical server health functions. It consists of two major parts:

- **MSM Server** is the data engine of MSM. It monitors the hardware and performs all the management actions. MSM Server must be installed on the HP ProLiant ML150 server. Once installed, the engine will be automatically loaded upon server booting.
- **MSM Console** is a browser-based program providing GUI for users at the client PC. Install MSM Console on a client system running Windows 2000, Windows Server 2003, or Windows XP that can access HP ProLiant ML150 server using the TCP/IP network.

Installing MSM

Installing MSM Server on the Server

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the HP ProLiant ML150 server running Microsoft Windows 2000 or Windows Server 2003. The *HP Startup CD-ROM* should start automatically.

NOTE: If the server does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the *HP Startup CD-ROM*.

2. Click **MSM (Remote Management Software)** on the screen.
3. Click **Click here to install MSM Server** on the screen to install MSM Server engine on the HP ProLiant ML150 server.

After the installation, you can click **Control Panel > Administrative Tools > Services > MSMDDataEngine** to see if the installation is successful.

Once installed, MSM Server will be automatically loaded after the HP ProLiant ML150 server boots.

Installing MSM Console on a Client PC

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of a PC running Microsoft Windows and having access to the HP ProLiant ML150 server using the TCP/IP network. The *Startup CD-ROM* should start automatically.

NOTE: If the PC does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the *Startup CD-ROM*.

2. Click **MSM (Remote Management Software)** on the screen.
3. Click **Click here to install MSM Console** on the screen to install MSM Console to the PC.

Once installed, you can start MSM Console on the PC by clicking **Start > Programs > TC System Monitor Console**. You can then perform remote management.

NOTE: For the detailed instructions on using MSM, please refer to the "Using MSM" section in Appendix A of this guide.

HP ML150 Server Health Driver (MSHD)

The HP ProLiant ML150 Server Health Driver (MSHD) is a Linux program that provides the critical server health functions.

Installing MSHD

NOTE: The lm-sensors driver (preinstalled in Linux systems by default) is used to access the reading data of the system fans. If you re-compile the kernel source, MSHD may not be activated. If this happens, make sure the lm-sensors driver of the kernel is enabled.

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the HP ProLiant ML150 server running Red Hat Linux 9.0 Professional, United Linux 1.0, Red Flag Linux 4.0 Advanced Server, or Turbolinux 8 Server.
2. Run the terminal program. When the window displays, follow the instructions to install MSHD:

- a. Mount the CD-ROM.

```
# mount /dev/hda /mnt
```

- b. Follow the instructions to copy the source package of MSHD 1.x, “mshd-1.0.i386.rh.rpm” to a Linux PC.

```
# cp /mnt/Utility/Mshd/V1.0/mshd-1.0.i386.rh.rpm /tmp
```

(for Red Hat Linux 9.0 Professional, Red Flag Linux 4.0 Advanced Server, and Turbolinux 8 Server)

```
# cp /mnt/Utility/Mshd/V1.0/mshd-1.0.i386.un.rpm /tmp
```

(for United Linux 1.0 – SCO Linux 4, SuSE Linux Enterprise Server 8, and turbolinux enterprise server 8)

- c. After copying the source package, please install MSHD.

```
# rpm -i /tmp/mshd-1.0.i386.rh.rpm
```

(for Red Hat Linux 9.0 Professional, Red Flag Linux 4.0 Advanced Server, and Turbolinux 8 Server)

```
# rpm -i /tmp/mshd-1.0.i386.un.rpm
```

(for United Linux 1.0 – SCO Linux 4, SuSE Linux Enterprise Server 8, and turbolinux enterprise server 8)

3. Shut down and reboot the server. MSHD is ready to use.

NOTE: For the detailed instructions on using MSHD, please refer to the “Using MSHD” section in Appendix A of this guide.

HP ML150 Server Health Driver for Unix (MSHD-U)

The HP ML150 Server Health Driver for Unix (MSHD-U) is a Unix program that provides the critical server health functions.

Installing MSHD-U

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the HP ProLiant ML150 server running SCO Open UNIX 8 or UnixWare 7.
2. Run the terminal program. When the window displays, follow the instructions to install MSHD-U:
 - a. Mount the CD-ROM.

```
# mount /dev/cdrom/cdrom1 /mnt
```
 - b. Follow the instructions to copy the source package of MSHD-U 1.0, “MSHD-U01.tar” to the /tmp directory of the Open UNIX 8 or UnixWare 7 system.

```
# cp /mnt/Utility/Mshd-u/MSHD-U01.tar /tmp
```
 - c. After copying the source package, please un-tar MSHD-U.

```
# tar xvf /tmp/MSHD-U01.tar
```
 - d. Please move to the directory of MSHD-U and install MSHD-U.

```
# cd /tmp/MSHD-U
# ./install
```
3. Shut down and reboot the server.

```
# shutdown -y -g0 -i6
```

MSHD-U is ready to use.

NOTE: For the detailed instructions on using MSHD-U, please refer to the “Using MSHD-O/-U” section in Appendix A of this guide.

HP ML150 Server Health Driver for OpenServer (MSHD-O)

The HP ML150 Server Health Driver for OpenServer (MSHD-O) is a Unix program that provides the critical server health functions.

Installing MSHD-O

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the HP ProLiant ML150 server running SCO OpenServer 5.0.7.
2. Run the terminal program. When the window displays, follow the instructions to install MSHD-O:
 - a. Mount the CD-ROM.

```
# mount /dev/cd0 /mnt
```
 - b. Follow the instructions to copy the source package of MSHD-O 1.0, “MSHD-O01.tar” to the /tmp directory of the OpenServer 5.0.7 system.

```
# cp /mnt/Utility/Mshd-o/MSHD-O01.tar /tmp
```
 - c. After copying the source package, please un-tar MSHD-O.

```
# tar xvf /tmp/MSHD-O01.tar
```
 - d. Please move to the directory of MSHD-O and install MSHD-O.

```
# cd /tmp/MSHD-O  
# ./install
```
3. Shut down and reboot the server. MSHD-O is ready to use.

NOTE: For the detailed instructions on using MSHD-O, please refer to the “Using MSHD-O/-U” section in Appendix A of this guide.

HP Server Diagnostics for Windows

NOTE: The HP Server Diagnostics for Windows is available for Windows 2000 and 2003 only.

The users may use the HP Server Diagnostics for Windows to examine the server for possible hardware problems.

Installing the HP Server Diagnostics for Windows

1. Insert the *HP Startup CD-ROM* in the CD-ROM drive of the HP ProLiant ML150 server running Microsoft Windows 2000 or 2003. The *HP Startup CD-ROM* should start automatically.

NOTE: If the server does not auto-start the **Startup** menu, start it by opening startup.htm, found at the root level of the *HP Startup CD-ROM*.

2. Click **Installing/Updating Diagnostics for Windows 2000** on the screen.
3. Click **Click here** on the screen to install the HP Server Diagnostics for Windows.
4. On the **File Download** window, click **Run this program from its current location** and click **OK** to continue.
5. On the **Security Warning** windows, click **YES** to continue.
6. Follow the onscreen instructions to unzip the files to the hard drive.
7. On the welcome screen, click **Next**.
8. When the HP Server Diagnostics for Windows is installed successfully, click **Finish** to complete the installation.

Once installed, you can start the Diagnostics software by clicking **Start > Settings > Control Panel > Diagnostics for Windows**. You can then perform remote management.

Using the HP Utilities

Using MSM

MSM Features

MSM contains the following features:

- **Authentication**

MSM Server Agent authenticates the user to log in MSM Server Agent and verifies corresponding privileges.

When logging in, please specify the server name (or IP address; **localhost** is shown for a local system), user name and password, domain (empty if no domain).

- **Remote Browsing**

You can use MSM Console to remotely browse the sensor readings from the console.

- **Remote Power Control**



MSM Console can turn off, turn on, or reboot the monitored server through the MSM Server Agent.

- **Sensor Reading Auto Refresh**

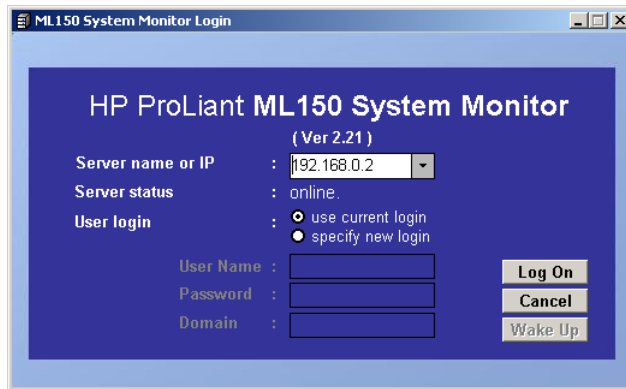
In MSM Console, clicking the **Monitor** indicator turns on and off the auto refresh function.

The refresh rate can be modified in the **General** tab of the General Settings panel.

- **Scope**
In MSM Console, you can view the sensor readings, and set the threshold and alert settings in the Scope panel.
- **Sensor Threshold Setting**
In MSM Console, you can set the sensor threshold setting to lower or upper in the Scope panel.
- **Alert and Error Action**
MSM Server Agent supports the alert and error action on the host server, such as email, power-off and reboot, when the sensor reading is abnormal. You can configure the settings in the Scope panel.
- **Alert History Log**
All alert (email, reboot and power-off) history can be logged in MSM Server Agent.
- **Sensor Reading Log**
Sensor readings can be logged in the specified file in MSM Console, and the log frequency equals to the refresh rate.
- **Operating Environment Computation (OEC)**
MSM Console monitors and calculates the host sensor readings at the specified time. You can configure MSM to automatically adjust the corresponding threshold. For the detailed instructions, refer to the Auto Tab section of “Configuring MSM” on page 12.
- **Floating Mini Window**
In MSM Console, the mini window will automatically scroll the sensor readings.


Right-clicking the left of the mini window allows you to access the MSM menu. To move the mini window, click and hold the left of the mini window.
- **MSM Console Icon**
Right-click the MSM Console icon  to access the MSM menu. When the window is minimized, click MSM Console icon  to restore the MSM window.
- **Auto Fan Control**
The Auto Fan Control function allows the system to automatically adjust the fan speed to high, medium or low according to the system’s temperature. Enabling this function can reduce noises and power consumption when the system runs in full speed.

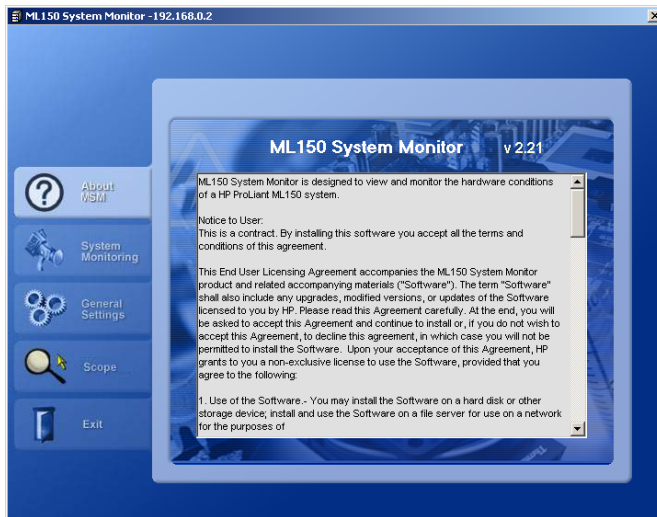
Starting MSM




When you log in MSM, there are several items for setup:

- **Server Name or IP**
Enter the name or IP of the server to be monitored.
- **Server Status**
The login status or warning message will be displayed when you use this login console.
- **User login**
Select an identity to log in MSM Console.
- **Log On**
Log in MSM Console to monitor the system you select.
- **Cancel**
Exit the login console.
- **Wake Up**
Wake up the system you select when it is in the Power-off or Standby status.

Click the **Log On** button to start MSM Console after selecting the correct information. The MSM window will appear displaying the license agreement of MSM. The MSM Console icon  also appears on the taskbar.




A mini window  appears displaying the reading values of the system's fan, voltage and temperature one at a time.

NOTE: You can disable or enable the mini window by right-clicking the MSM Console icon  on the taskbar and then selecting **Disable MiniWin** or **Enable MiniWin** from the pop-up menu.


Changing the Server

You can change the server to be monitored without having to exit MSM.

Right-click the MSM Console icon  on the taskbar and then select **Change Server** from the pop-up menu. The login window appears for you to re-log in MSM and start monitoring this server.

Exiting MSM

To exit MSM, do one of the following:

- Click the **Exit** panel in the MSM window.
- Right-click the MSM Console icon  on the taskbar and then select **Exit ML150 System Monitor** from the pop-up menu.

Indicators

There are three indicators and a LED on the upper right corner of the MSM window. The indicators display the status of **WatchDog**, **OEC**, and **Monitor** with the on/off indication below. The LED displays the status of the system monitoring.

Starting Auto Refresh of Sensor Readings

Click **off** below **Monitor**. The LED turns from red to green indicating that auto refresh of the sensor readings has been enabled.

To turn off the auto refresh function, click **on** below **Monitor**.

NOTE: If you press the **Refresh** button on the System Monitoring panel once without turning on the **Monitor** indicator, the sensor readings will be refreshed only once.

Starting Auto Reset of Threshold Values

Click **off** below **OEC**. A message appears to confirm that OEC is starting. When the **OEC** indicator is turned on, the **Monitor** indicator will be turned on as well.

NOTE: You need to first set the OEC duration in the **Auto** tab of the General Settings panel before turning on the auto reset of threshold values. Refer to the later section for details.

To turn off the auto reset function, click **on** below **OEC**. The **Monitor** indicator will be turned off as well.

Starting Watch Dog

If the sever hangs, Watch Dog allows the server to reboot automatically as the hardware counter timer reaches the timeout value. To enable Watch Dog, click **off** below **WatchDog**.


NOTE: You can set the Watch Dog timeout value in the **General** tab of the General Settings panel. Refer to the later section for details.

Configuring MSM

You can configure the MSM settings by using the System Monitoring, General Settings, and Scope panels.

System Monitoring

To access the System Monitoring panel, do one of the following:

- Click the **System Monitoring** panel in the MSM window.
- Right-click the MSM Console icon  on the taskbar and then select **System Monitor** from the pop-up menu.

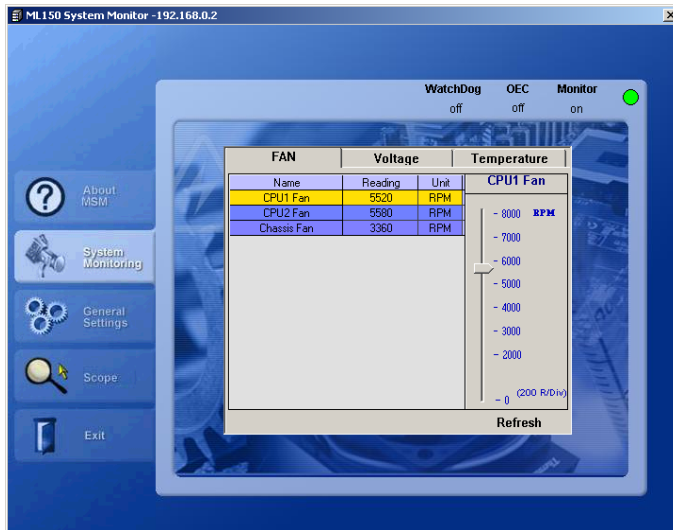
In this panel, you can monitor all reading values of sensors about the fan, voltage and temperature of the system.

Click the **Refresh** button on the lower right corner for the current readings.

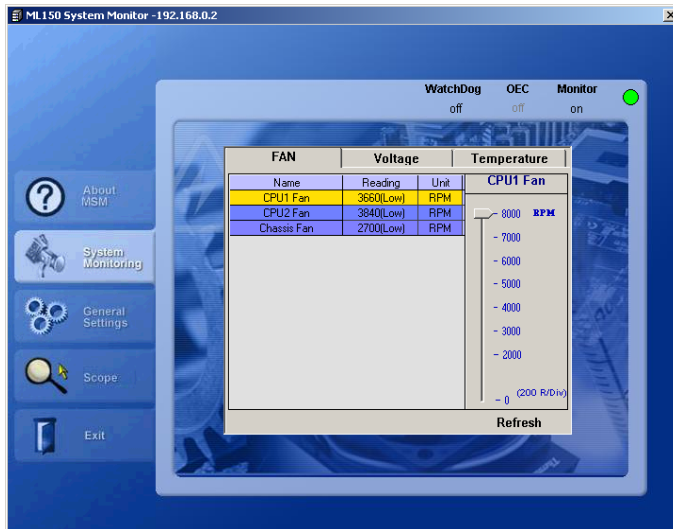
Fan Tab

The **FAN** tab displays the rpm information about CPU1 Fan, CPU2 Fan, and Chassis Fan.

- When the Auto Fan Control function is disabled:



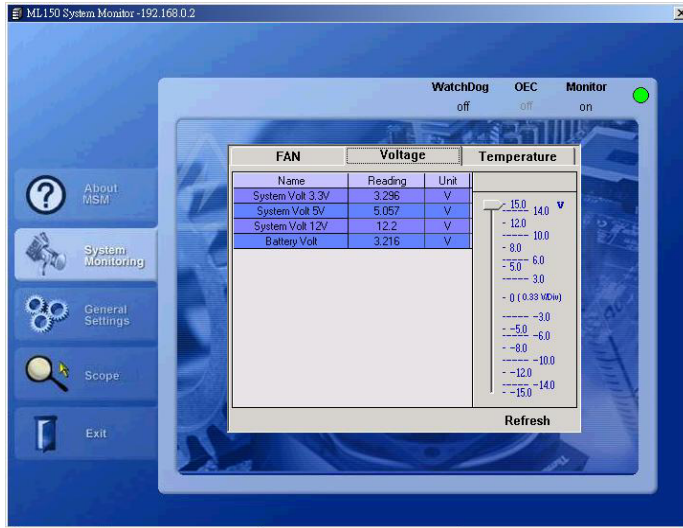
- When the Auto Fan Control function is enabled:



NOTE: You can enable/disable the Auto Fan Control function in the **Auto** tab of the General Settings panel. Refer to the later section for details.

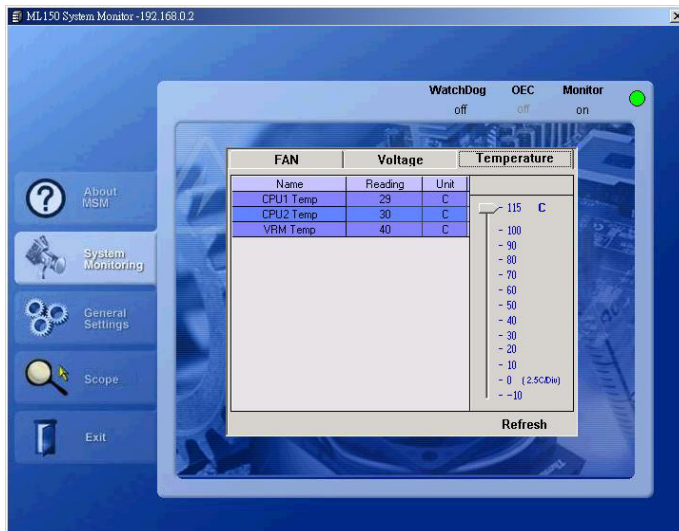
Voltage Tab

The **Voltage** tab displays the information on System 3.3V/5V/12V and Battery Volt.




Temperature Tab

The **Temperature** tab displays the temperature information on CPU1, CPU2, and VRM.



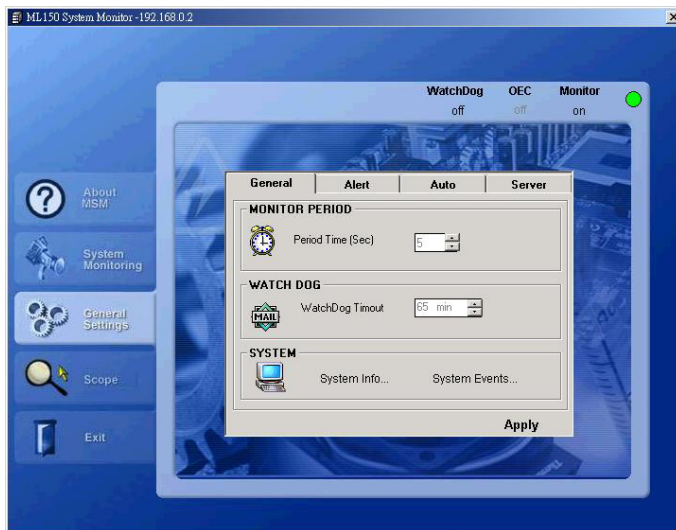
General Settings

To access the System Monitoring panel, do one of the following:

- Click the **General Settings** panel in the MSM window.
- Right-click the MSM Console icon  on the taskbar and then select **General Setting** from the pop-up menu.

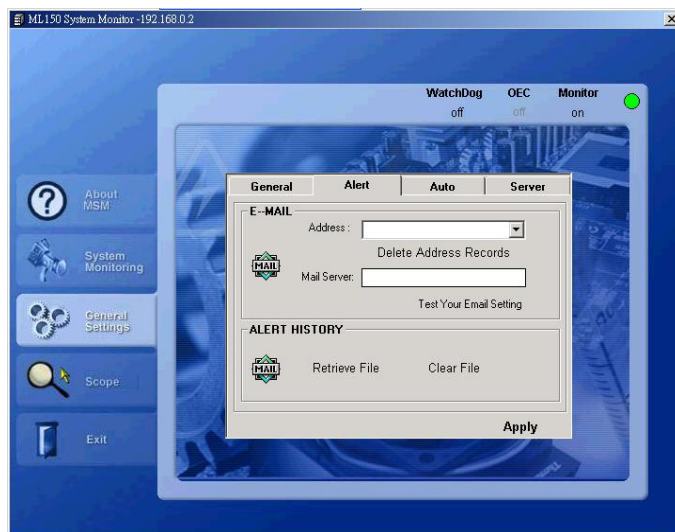
After changing the settings, click the **Apply** button on the lower right corner for the change to take effect.

General Tab



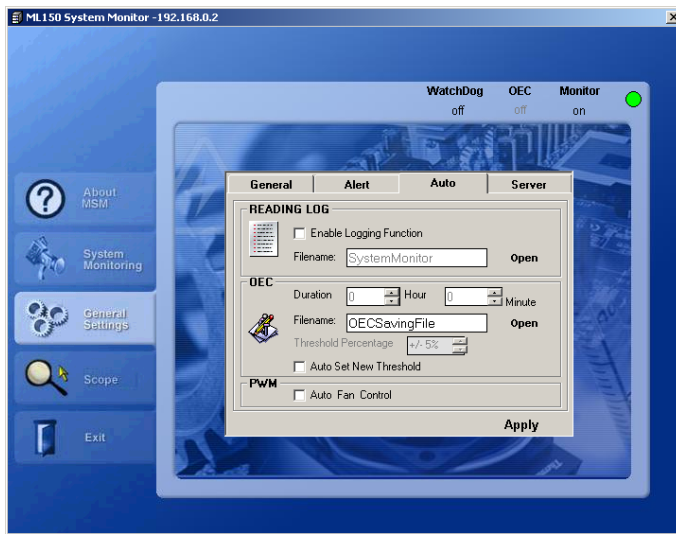
- **MONITOR PERIOD**
sets the period for refreshing MSM Console.
- **WATCH DOG**
sets the Watch Dog timeout value. If the server hangs, it will reboot automatically as the hardware counter timer reaches the timeout value.
- **SYSTEM**
displays the system information and events about the monitored server.

Alert Tab



- **E-MAIL**
sets the e-mail address and mail server for receiving alert messages. The server agent can send multiple e-mails to the same SMTP server upon the system's alert.
- **ALERT HISTORY**
Click **Retrieve File** to view all alert events and related information; click **Clear File** to delete all alert records.

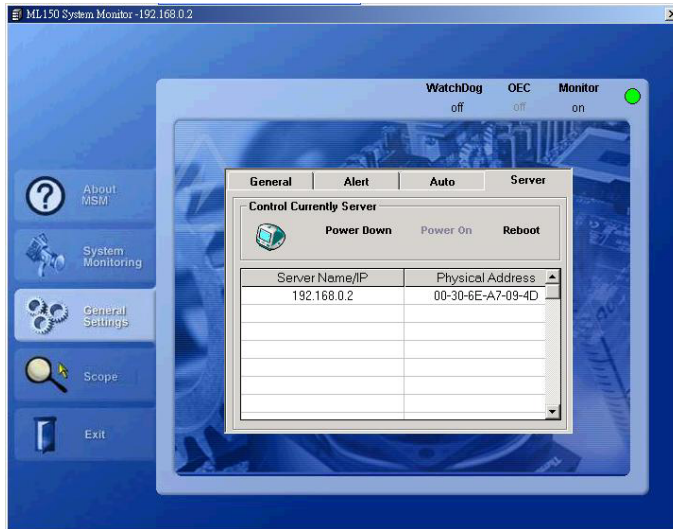
Auto Tab



- **READING LOG**
All reading values of sensors are recorded in the SystemMonitor text file when the **Enable Logging Function** item is enabled.
- **OEC**
sets the OEC duration. To automatically reset the threshold values of all sensors, follow this procedure:
 - a. Enable the **Auto Set New Threshold** item.
 - b. Click the **Apply** button on the lower right corner.
 - c. Click **off** (to turn it into **on**) below the **OEC** indicator on the upper right corner of the MSM window.
- **PWM**
Enable the **Auto Fan Control** item to start the Auto Fan Control function. This function allows the system to automatically adjust the fan speed to high, medium or low according to the system's temperature. Enabling this function can reduce noises and power consumption when the system runs in full speed.


Server Tab

This tab allows you to remotely turn off, turn on, or reboot the monitored server through MSM Console.



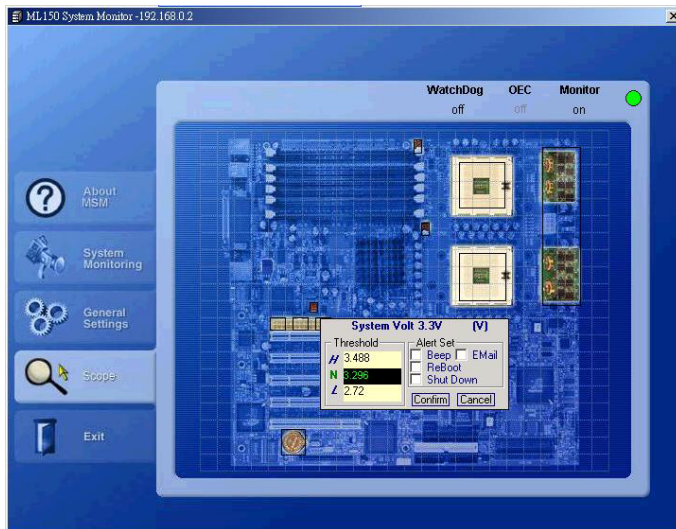
Scope

To access the System Monitoring panel, do one of the following:

- Click the **Scope** panel in the MSM window.
- Right-click the MSM Console icon  on the taskbar and then select **Scope** from the pop-up menu.

You can monitor the reading values and threshold values of appeared components, and set alert functions when the reading value is over the threshold value.

- The appeared components include VRM, CPU, FAN, Battery, and System Power.
- The alert functions include Beep, ReBoot, Shut Down, and Email.



Using MSHD

MSHD Features

- **Fan Status Check**
MSHD detects if the CPU or system fans are in a healthy state. An alert message will be logged when a bad fan status is detected, and a notice message will be logged when the fan status is recovered.
- **Auto Fan Control**
The Auto Fan Control function allows the system to automatically adjust the fan speed to high, medium or low speed according to the system's or CPU's temperature. Enabling this function can reduce noises and power consumption when the system is in the idle mode.
- **Alert Log**
Every change of the fan speed will be logged. An alert message will be logged whenever a bad fan status is detected.

Starting MSHD

To start MSHD, type `/etc/init.d/mshdd start`, or `redhat-config-service` under Red Hat 9 or other Linux kernel operating systems supported by the HP ProLiant ML150 server.

Stopping MSHD

To stop MSHD, type `/etc/init.d/mshdd stop`, or `redhat-config-service` under Red Hat 9 or other Linux kernel operating systems supported by the HP ProLiant ML150 server.

Checking the Program Status

To check the program status, type `/etc/init.d/mshdd status`, or `redhat-config-service` under Red Hat 9 or other Linux kernel operating systems supported by the HP ProLiant ML150 server.

Checking the Log Information

To check the MSHD results and log messages, type `chklog`. The screen will display the usable arguments. For example:

- `chklog all`: checking all testing results
- `chklog info`: checking all testing information
- `chklog alert`: checking the alert results only

NOTE: The alert messages are automatically appended and logged to the system log file when the fan speed is lower than the MSHD pre-defined limit value.

- `chklog notice`: checking the notice results only

NOTE: The notice messages are automatically appended and logged to the system log file when the fan speed returns to the normal condition from the condition of beyond the MSHD pre-defined limit value.

- `chklog all -f [filename.log]`: logging the results to file

For example: `chklog all -f test.log`

Displaying the Fan and Temperature Status

To display the MSHD results and log messages, type `chkval`. For example:

- `chkval`: displaying the values once
- `chkval -c number`: displaying the refreshed values for the specified times

For example: `chkval -c 3`

- `chkval -m loop`: displaying the refreshed values continuously until you press the **Ctrl-C** keys to stop displaying
- `chkval -m loop pwm`: displaying the refreshed values (including the PWM value) continuously until you press the **Ctrl-C** keys to stop displaying
- `chkval -m loop -f [filename.log]`: displaying the refreshed values continuously and logging the results to a file until you press the **Ctrl-C** keys to stop displaying

For example: `chkval -m loop -f test.log`

- `chkval -m loop pwm -f [filename.log]`: displaying the refreshed values (including the PWM value) continuously and logging the results to a file until you press the **Ctrl-C** keys to stop displaying

For example: `chkval -m loop pwm -f test.log`

Using MSHD-O/-U

MSHD-O/-U Features

- **Fan Status Check**
MSHD-O/-U detects if the CPU or system fans are in a healthy state. An alert message will be logged when a bad fan status is detected, and a notice message will be logged when the fan status is recovered.
- **Auto Fan Control**
The Auto Fan Control function allows the system to automatically adjust the fan speed to high, medium or low speed according to the system's or CPU's temperature. Enabling this function can reduce noises and power consumption when the system is in the idle mode.
- **Alert Log**
Every change of the fan speed will be logged. An alert message will be logged whenever a bad fan status is detected.

Starting MSHD-O/-U

To start MSHD-O/-U, type `mshdd_sh start`.

Stopping MSHD-O/-U

To stop MSHD-O/-U, type `mshdd_sh stop`.

Checking the Program Status

To check the program status, type `mshdd_sh status`.

Checking the Log Information

To check the MSHD-O/-U results and log messages, type `chklog`.

NOTE: The alert messages are automatically appended and logged to the system log file when the fan speed is lower than the MSHD-O/-U pre-defined limit value.

NOTE: The notice messages are automatically appended and logged to the system log file when the fan speed returns to the normal condition from the condition of beyond the MSHD-O/-U pre-defined limit value.

Displaying the Fan and Temperature Status

To display the MSHD-O/-U results and log messages, type `mshd_read number` to display the refreshed values continuously until you press the **Ctrl-Backspace** keys to stop displaying.

For example: `mshd_read 100`.

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